

COMMERCIAL CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS

APRIL 1949

ANNOUNCING! A GREAT NEW
REO Speed Wagon
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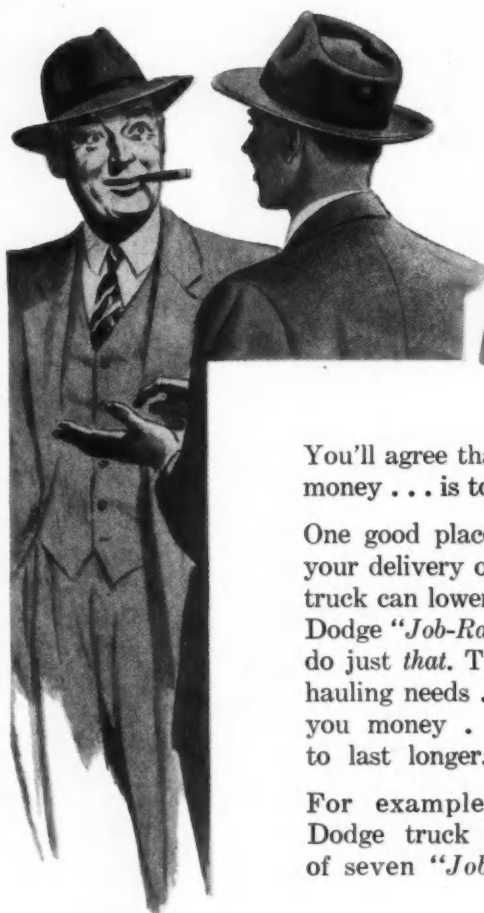
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OVERLAND HAULERS: Lower Delivery Costs Mean Lower Overhead

You'll agree that a good way to *make* money . . . is to *save* money.

One good place to watch costs is in your delivery operation. For the *right* truck can lower delivery costs plenty! Dodge "*Job-Rated*" trucks are built to do just *that*. They're built to *fit* your hauling needs . . . save you money . . . and to last longer.

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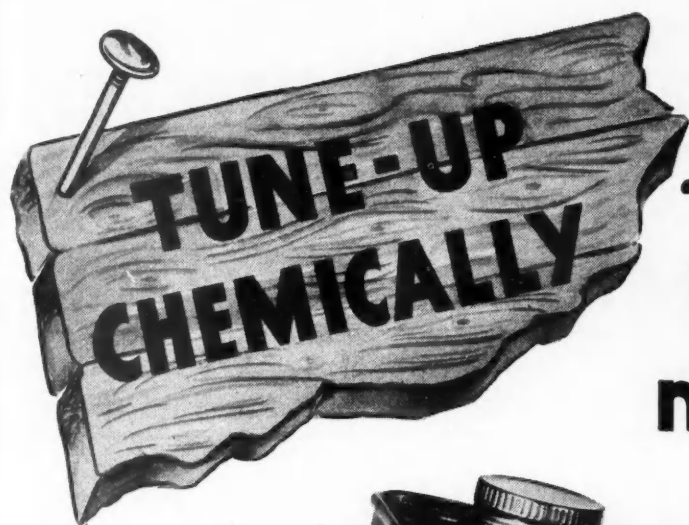
Each has exactly the right clutch, transmission, rear axle, and every other unit . . . "*Job-Rated*" for maximum dependability, and long life.

Let your Dodge dealer tell you the whole "*Job-Rated*" story. You'll quickly realize his story makes sense! And remember . . . *only* Dodge builds "*Job-Rated*" trucks.



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Switch to **DODGE**
"*Job-Rated*" **TRUCKS**



...before
**you tune-up
mechanically**



Before you tune-up an engine, make sure it is "chemically clean". Just add Permatex Toon-Oyl to crankcase oil, warm up engine and let it idle. Sludge and carbon-gum binders that interfere with the smooth operation of valves, piston rings, oil lines and oil screens, will be loosened, disbursed and dissolved!

Then, you'll have a "Chemically Clean" engine, ready for your accurate mechanical adjustments!

PERMATEX COMPANY, INC., BROOKLYN 29, N. Y.

1949 FLEET OPERATORS' REFERENCE

Vol. LXXVII COMMERCIAL CAR JOURNAL No. 2

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COMMERCIAL CAR JOURNAL

with which is combined Operation & Maintenance

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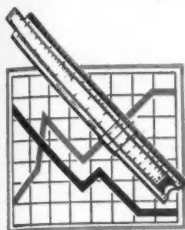
ANNUAL

APRIL 1949

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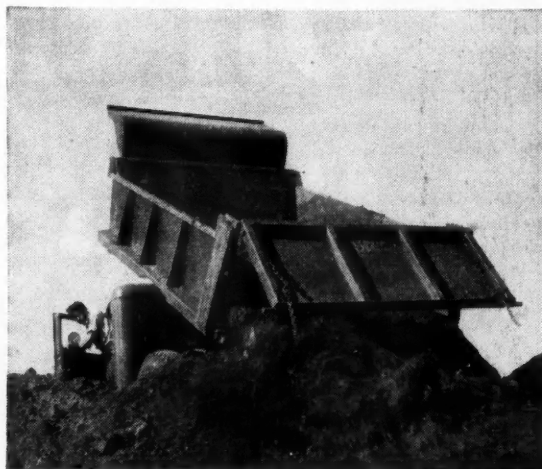
PAUL WOOTON, *Washington Member of the Editorial Board*

COMMERCIAL CAR JOURNAL, April, 1949



Going up...

St. Paul Hoists are fast and sure



All out...

St. Paul Bodies dump clean

St. Paul Hydraulic Hoists are fast and dependable. Roller-bearing pump, honed cylinder, cast steel lifting arms all combine to keep them "going up" over a long useful life. (Model 47 Hoist illustrated)

St. Paul Bodies are all steel, welded. 4 cu. yd. Type BR, as illustrated, has a sturdy sub-structure of channel longbeams and channel cross-members. Body shell is 10 gauge steel with all inside welds ground smooth to assure clean dumping.

**Write for illustrated literature or
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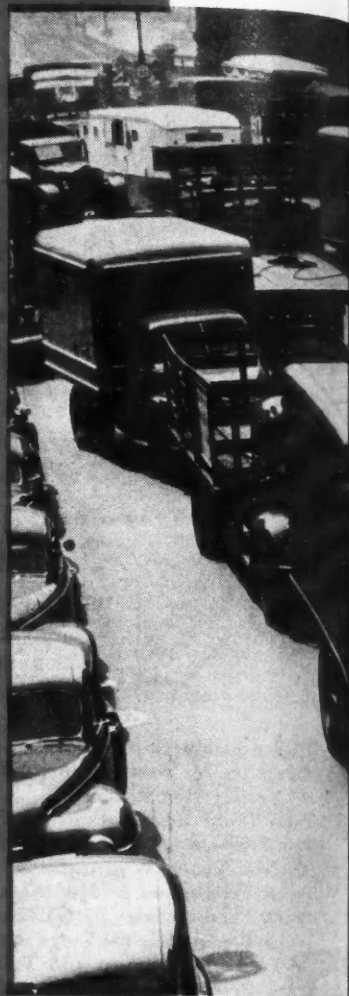
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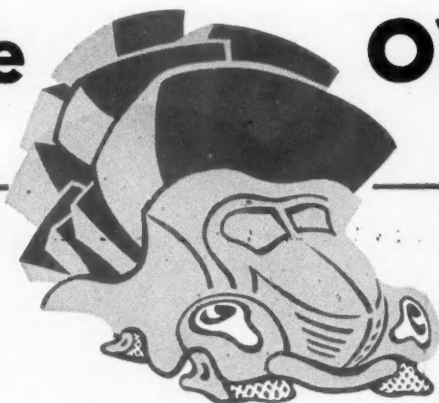
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TEXACO STAR THEATRE
presents MILTON BERLE
every Wednesday night.
See newspaper for
time and station.



TEXACO

The

OVERLOAD



by George T. Hook

Editor

An Appraisal of a Triple-Threat Anti-Truck Offensive

THE 1949 sessions of State Legislatures were no sooner getting down to serious business than they were showered with propaganda which was anti-truck no matter how well buttered it was in several instances with protestations of goodwill. The lightning, some of which was pure heat, struck from three different sources: Robert R. Young, chairman of a railroad holding company; Thomas H. MacDonald, commissioner of Public Roads, and the American Automobile Association.

Young, readers may remember, is the man who several years ago practically single-handed fought the battle of the common man who has to travel from Coast to Coast on the railroads. His C & O railroad advertisements pictured a pig occupying its lordly berth in a box-car and asked a pertinent question to this effect: A pig can cross the continent without changing cars, why can't you?

Thanks to Mr. Young's crusade we can now cross the continent on the railroads like pigs.

Having run out of pigs, Mr. Young set out to get control of the New York Central. He criticized its management, and in fact the management of all railroads, his own excepted. Oddly enough his criticisms on the whole had popular approval and were pointedly pertinent. By direct statement and implication he considered railroad management unprogressive, inefficient and still living in the public-be-damned era. But the I.C.C. wasn't impressed. It vetoed his bid for N. Y. Central control.

Mr. Young thought so poorly of the railroads and their spokesman, the Association of American Railroads, that he organized a spokesman of his own, the Federation for Railway Progress.

But it seems that the railroads, Mr. Young's own not excepted, are experiencing the adverse effects of these disinflationary times and he thinks something should be done about it. So (other times, other morals) Mr. Young now turns from criticism of the railroads to criticism of its highway competitor, the truck.

At the opening of the new headquarters of his Federation for Railway Progress he called together the press of Washington and plagiarized all the railroad executives whom for years he has been criticising as unprogressive. Like them, he advocated hamstringing of motor truck competitors as the way to railroad progress. He advocated Federal legislation to limit the size and weight of trucks and to make truck operators pay "a fair share

of road costs." Mr. Young had to excel his ilk in some particular so he predicted that "unless something is done about this deplorable situation, the Nation will go back to dirt roads." Doesn't that scare you?

Mr. Young got some publicity on the inside pages of newspapers, but it isn't likely that he will get a hearing in Congress or in State Legislatures. His is too obviously selfish, special-interest pleading.

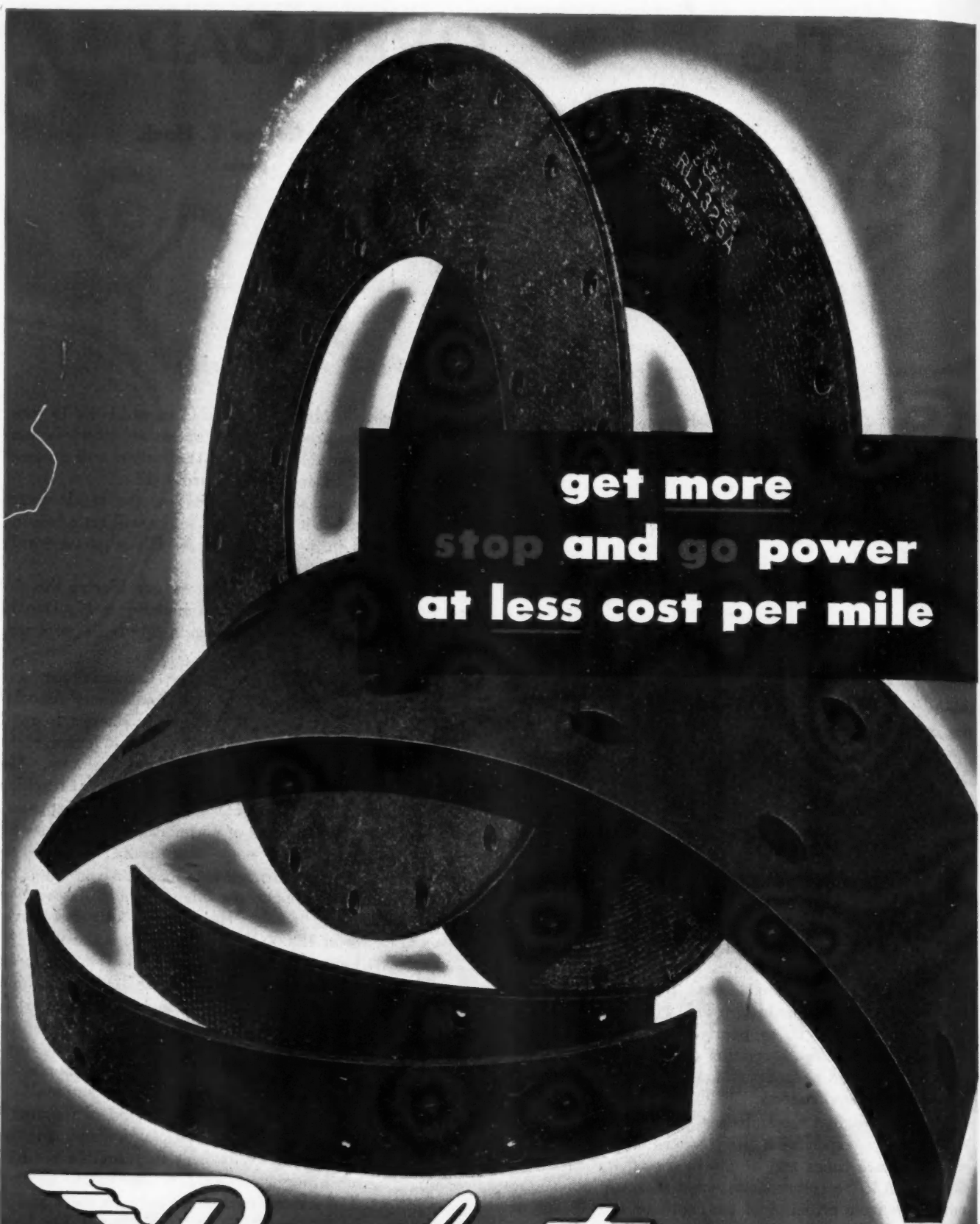
The propaganda (for such it was, considering the circumstances of its delivery) of Commissioner MacDonald wore a more becoming cloak of authority but even it was threadbare.

It is our understanding that the Commissioner was scheduled to address the American Road Builders' Association on an engineering topic of specific interest to road builders. Instead he chose to speak on their forum, right over their heads and directly at State Legislators. He deplored what he called the growing tendency of truckers to overload in an effort to cut down operating expenses. He said this was a matter of serious interest because of the drive that was being made in a number of States to obtain legislation authorizing axle loads heavier than the 18,000-lb limit recommended by the American Association of State Highway Officials. He declared flatly that "Axle loads in excess of 18,000 lb should not be authorized."

And what incontrovertible proof did the Commissioner have to support his dictum? The AASHO Code, which recommends the 18,000-lb axle load is, he said, "the product of many years of research, of field tests, of numerous conferences, and of experience. It has generally the support of the State highway and motor vehicle officials, of automotive manufacturers and of user organizations."

The product of many years of what kind of research? Where? By whom? Where in black and white, are the results of the research? Why isn't the tangible product of this research brought out whenever the truck industry asks for proof of statements that are made in the name of engineering or research? The truck industry has been leading with its chin for years. It is still leading and still asking "Where is the incontrovertible, engineeringly sound, scientifically-researched proof that modern highways will not support axle loads above 18,000 lb without detriment?"

The product of many years of what kinds of field tests? Field tests proving what? Conducted by what unbiased,
(TURN TO PAGE 18, PLEASE)



**get more
stop and go power
at less cost per mile**

Raybestos

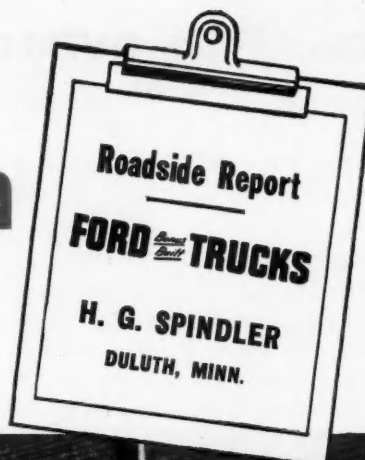
**America's Biggest Selling
BRAKE LINING**

The Raybestos Division of RAYBESTOS-MANHATTAN, Inc., Bridgeport, Conn.



RAYBESTOS-MANHATTAN, INC., Manufacturers of Brake Linings • Brake Blocks • Clutch Facings • Fan Belts • Mechanical Rubber Products
Exhaust Hoses • Rubber Covered Equipment • Asbestos Textiles • Packings • Powdered Metal Products • Abrasive Diamond Wheels • Sewing Belts

"Economy of the FORD F-7 Puts it on Top of our List!"



"WE ARE pleased with the outstanding performance of our Ford F-7 Big Job," reports Howard G. Spindler of Duluth, Minnesota. "Its roadability . . . the ease with which it handles our big vans . . . and its gas economy puts it on the top of our list in our fleet of 22 trucks."

Owners and drivers sing the praises of the new Ford Big Jobs. Owners like Big Job extra power and low cost operation. They claim the new 145-horsepower engine outsaves engines much smaller in size. Drivers are enthusiastic about the ease and comfort of the Million Dollar Cab and its Ford Level Action suspension. Both are impressed by Ford Bonus Built construction, characteristic of 139-plus models in a full truck line. Bonus Built is the super-strong construction that contributes to long truck life.



BUILT STRONGER TO LAST LONGER

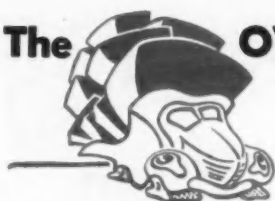
USING REGISTRATION DATA ON 5,444,000 TRUCKS,
LIFE INSURANCE EXPERTS PROVE FORD TRUCKS LAST LONGER!

ONLY THE FORD BIG JOB HAS ALL THESE FEATURES!

- ★ New 145-h.p. Ford V-8 engine for top performance.
- ★ Ford exclusive concentric dual-throat carburetor for more power, more economy.
- ★ New heavy duty 5-speed transmissions for operating flexibility.
- ★ Big Ford power-operated brakes for sure-footed stopping; rear 16-inch by 5-inch on the F-8.
- ★ Ford Super Quadrax 2-speed axle with vacuum shift for performance flexibility in Model F-8 (single-speed axle also available); single-speed Quadrax Hypoid Axle in Model F-7.
- ★ Large diameter (10-inch) wheel bolt circle with 8 studs to allow for extra-strong hub construction.
- ★ Million Dollar Cab with Ford Level Action suspension for greater driving comfort.
- ★ Nationwide service from over 6,400 Ford Dealers.
- ★ Ford Bonus Built construction for long truck life.

Gross Vehicle Weight Ratings: F-8 up to 21,500 lbs., F-7 up to 19,000 lbs. Gross combination ratings: F-8 up to 39,000 lbs., F-7 up to 35,000 lbs.

The OVERLOAD



Continued from Page 15

bureaucratic, politically-appointed authorities? Bring out the proof, and let it silence all the unbelievers.

The product of many years of what kinds of conferences? Conferences that ended in a little give here and a little take there? Conferences that ended in concessions dictated by political expediency?

The product of many years of what kind of experience? Experience that varies with States? Experience that ignores the experience of States that have axle loads in excess of 18,000 lb?

And as for having the support of automotive manufacturers and of user organizations, isn't the Commissioner aware that this support was given with the definite understanding that the 18,000 lb axle limit was to be considered a floor and not a ceiling as is now being advocated? Isn't the Commissioner aware that manufacturers and users asked for and received assurances that it was the intention to bring sub-standard States up to the 18,000-lb standard but not to lower the limits of States which exceeded that standard now or which might wish to exceed that standard in the future? Would the Commissioner like to see the minutes of some of *those* conferences? They are available.

Operation Prejudice: An Opportunity for the Truck Industry

THE attitude of many car drivers to the motor truck is steeped in prejudice. They have the perverted notion that the highways are intended primarily for touring, visiting, shopping and getting to and from their places of employment, in just about that order of importance. What sort of instruction, therefore, must young people be given to implant in their consciousness the inherent right of the motor truck to its portion of the highway?

Leaders in truck association and in manufacturing circles should begin giving this question some serious thought. Educators will be seeking their advice if other states follow California's lead—as they certainly will—in adopting laws which make compulsory the instruction of high school students in the art and obligations of automobile driving. This form of obligatory training recognizes that the important attitudes as well as the skills of automobile driving are best indoctrinated in the formative years.

Fleet operators have long been advocates of high school driver training because they realize that in various ways they are bound to be among its beneficiaries. In many localities they have financially supported such training. But this localized training has dealt largely, if not entirely, with teaching high school students how to drive. Because such instruction has been optional with the student, the emphasis on the "how" perhaps has been necessary in order to attract trainees. Any mention of indoctrination

Commissioner MacDonald made much of the fact that the "pumping" of concrete pavement slabs is a "wide-spread occurrence." But has the Commissioner collected proof that such pumping is more prevalent in States with 20,000 and 22,400-lb axle limits than in States with the 18,000-lb limit? If he has, why doesn't he cite it? It would be a most telling blow.

It was nice of the Commissioner to state publicly that he was not "up in arms" against the trucking industry as a whole; that truck transport is "of incalculable value" in the national economy and that every effort should be made to develop it for the greatest benefit to the Nation; and that the majority of trucks now in use are not overloaded. But these are buttering-up statements that do not in any way take the sting out of his critical statements, statements which still cry out for factual support.

The third attack came from American Automobile Association headquarters in Washington. It was obviously an attempt to make capital of Commissioner MacDonald's statements. The AAA charged that "Billions of dollars worth of the nation's finest highways are being pounded to pieces by overweight and overloaded commercial vehicles."

Asked to prove its sensational and irresponsible charge, the AAA replied with sweeping generalizations. Of course it could marshal no proof—not even if it had depended upon the Commissioner of Public Roads.

All in all the attacks, varying as they did from the unsupported to the fantastic and irresponsible, should not do truck operators any irreparable damage. They hit below the belt, but no lower than the industry has been hit before and will be hit in the future.

in attitudes and obligations might have discouraged voluntary participation.

In a compulsory program which includes instruction in attitudes and obligations, the nature of such instruction becomes important to all operators of motor trucks and truck manufacturers. Any such instruction certainly should include material which would give the student a historical background of the origin and the original purpose of highways; the social contributions of the motor truck; the place of the motor truck in the economic structure of the country; the dependence of every community on motor trucks; and the manner in which motor truck operators are fulfilling their obligations to other users of the highways.

Young people should be exposed to such enlightenment — straightforward, documented, interestingly presented and easily assimilated by means of visual presentations, free of special pleading. Unless they are, they cannot have a full appreciation of their obligations and their proper attitude toward those users of the highways who are the chief objects of car-driver prejudice and the principal sufferers when this unreasonable attitude expresses itself in the form of antagonism.

It will be natural for educators, approaching this new field of instruction, to seek the help of those who are best qualified to give it in the formulation of a proper curriculum. The truck industry should be ready.

MARMON-HERRINGTON

All-Wheel-Drive



Big Trucks—and Small for Every Tough Job Call

In the Marmon-Herrington line you will find an *All-Wheel-Drive* truck—with the right power, in the right capacity—to fit every tough trucking job exactly, however big or small.

Marmon-Herrington offers twenty-two *All-Wheel-Drive* models in all. Four are heavy-duty models of the company's own manufacture; the balance are standard Ford models converted to *All-Wheel-Drive* by Marmon-Herrington. Wheel-

bases range from 110 inches to 220 inches—gross vehicle weights from 5,300 pounds to 42,000 pounds. There are 7 great engines, Diesel and gasoline—from 4 to 10 forward speeds, 1 to 4 reverse.

Live power and traction in all wheels—*front wheels pulling, rear wheels pushing*—give Marmon-Herringtons tremendous tractive power for toughest off-the-road operations . . . no mud too deep, no hill too steep, no going too rough and rugged. Let your Marmon-Herrington dealer give you an on-the-job demonstration of these great *All-Wheel-Drive* trucks. You'll witness an eye-opening brand of performance-ability.

MARMON-HERRINGTON COMPANY, INC. • INDIANAPOLIS 7, INDIANA



MARMON-HERRINGTON

All-Wheel-Drive

Time Out for PLAY

Meshword Puzzle

Purchasing Power

File	\$1.00	Drill	7.00
Screw driver ..	2.00	Plane	8.00
Hammer	3.00	Vise	9.00
Pliers	4.00	Jack	10.00
Flashlight ...	5.00	Spray gun ..	11.00
Wrench	6.00	Micrometer ..	12.00

Marking Time

GRAY

Profit

Hearing devices

Make well

Smartly dressed

Business

One against

A wise man

A coin

The back

WHITE

Part of a shoe

Crosby the singer

Humid

Signify

A pronoun

Bullet sound

Glass sound

A corrosive fluid

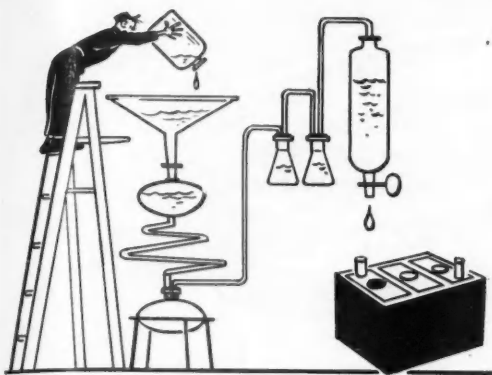
Of different colors

DON'T PEAK—Solutions Will Be Found on Page 168

Shop Magic

By changing only one letter you can change a fruit into a spark producer: PLUM—PLUG. Now try your wits on the following:

1. Change a metal thread into a rubber casing.
2. Change a staff for crippled people into a coupling.
3. Change a piece of twine into a shock absorber.
4. Change a small nail into a truck-lifting device.
5. Change a piece of money into a spiral of wire.
6. Change a stone into something that will keep the doors of a truck closed.
7. Change something in which a child saves his pennies into a container for gasoline.



Conference Corner

Question:_____

**Is Tap or Well Water Safe to Use in Batteries—
Or Should Only Distilled Water Be Added?**

Battery Manufacturers Agree in Principle . . .

Clarifying a much-debated controversy among battery service men and fleet operators, engineers say that all risk of contaminating the electrolyte is eliminated if distilled water is used . . . but any water that has been

analyzed, found fit to drink and free from minerals, alkalies and other agents harmful to battery action can be used in an emergency.

Any water not crystal clear and having a noticeable taste or odor

should be avoided. Rainwater or snow water is recommended as a substitute. Well water, or spring water from an unknown source should not be used. They emphasize, however, that *any* water is better than none.

Slightly Impure Water Will Cut Life But Little

Willard Storage Battery Co.

"Generally speaking, tap or well water can be used in place of distilled water in storage batteries, clarifying a much-debated controversy among battery service men.

"The chemists agree that for absolute protection, distilled water is the only answer, but for all practical purposes, any water supply which is palatable and sanitary is satisfactory.

"Under present driving conditions, they say, so many factors are attacking the life of the battery that the addition of slightly impure water will reduce the life of the battery only a negligible amount.

"When in doubt, a battery dealer can send a sample of his local water supply to any reliable chemist for analysis. It is suitable for use if it does not contain more than 15 parts per million of chlorine as chlorides and not more than 150 parts per million total solids.

"Rainwater also is recommended as a distilled water substitute where tap or well water is unsuitable. Frost chipped from refrigerator coils and melted provides water of high purity, but the amount of water obtainable in this manner is limited."

Water From Approved Source Can Be Used With Safety

by C. R. Mason
Service Manager

The B. F. Goodrich Co.

"Battery manufacturers use great care in selecting materials which are as pure as possible, chemically. The presence of iron, mercury, or copper, causes local action which accelerates self-discharge and shortens battery life. Chlorine or nitric acid attacks the grids, causing rapid disintegration of the plates. Most of the substances mentioned may be added in greater or lesser quantity by using water from an unknown source of supply.

"All risk of contaminating the electrolyte in batteries is eliminated by using distilled water, but if it is not available or if its use entails considerable additional expense, water from an approved source can be used in automotive batteries with safety. With the exception of a few communities, the water furnished by modern city supply systems can be safely used. In localities where city water is not usable, battery dealers undoubtedly are familiar with that fact. It is the use of well water or spring water from unknown sources which should be avoided, as it may carry, in solution, quantities of harmful metals or alkalies."

(TURN TO PAGE 30, PLEASE)

you add to
the Efficiency of



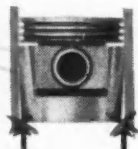
RAMCO
10_{up}
Piston
RINGS
HERE

RE-POWERING JOBS

with RAMCO Piston Stabilizers **HERE**



Pressure only where
it's needed.



"X" marks point of col-
lapse. CORRECT it where
it has happened, PRE-
VENT it where it hasn't.

THEY SNAP-IN

without Fuss or Fitting

Ramco Piston Stabilizers re-size and re-shape by exerting pressure only where collapse occurs—at right angles to the wrist pin (see drawing above). They take an unnecessary load away from the rings, they stop piston slap, they insure a longer-lasting, trouble-free job. Available for cast-iron, steel, semi-steel or aluminum pistons, car and truck.

Nothing adds more to the life and performance of a piston ring job than good piston alignment—and that's why every ring job deserves Ramco Piston Stabilizers.

Ramco Stabilizers are a part of the RAMCO RE-POWERING Method that "Does the Job Right"!

RAMCO **10_{up}** Piston Rings

IDEAL FOR ALL TRUCK AND FLEET RE-POWERING JOBS . . .
RE-BORE OR RE-RING!

Products of RAMSEY CORPORATION, 3710 Forest Park Blvd., St. Louis 8, Missouri: Piston Skirt Stabilizers . . . Seal-Tite Piston Rings . . . Oil-Tyte Piston Rings . . . Spirolox Retaining Rings, Spiro-Seal Grease Seals and Dust Seals . . . Famous RAMCONizer Machine for re-shaping collapsed piston skirts . . . Ramco 3-Up Parts Cleaner. Factories: St. Louis and Sullivan, Mo.; Fruitport, Mich.; Toronto 8, Ont., Canada.

Copyright 1948 Ramsey Corporation R 2735 FO

TOP NEWS OF THE YEAR!

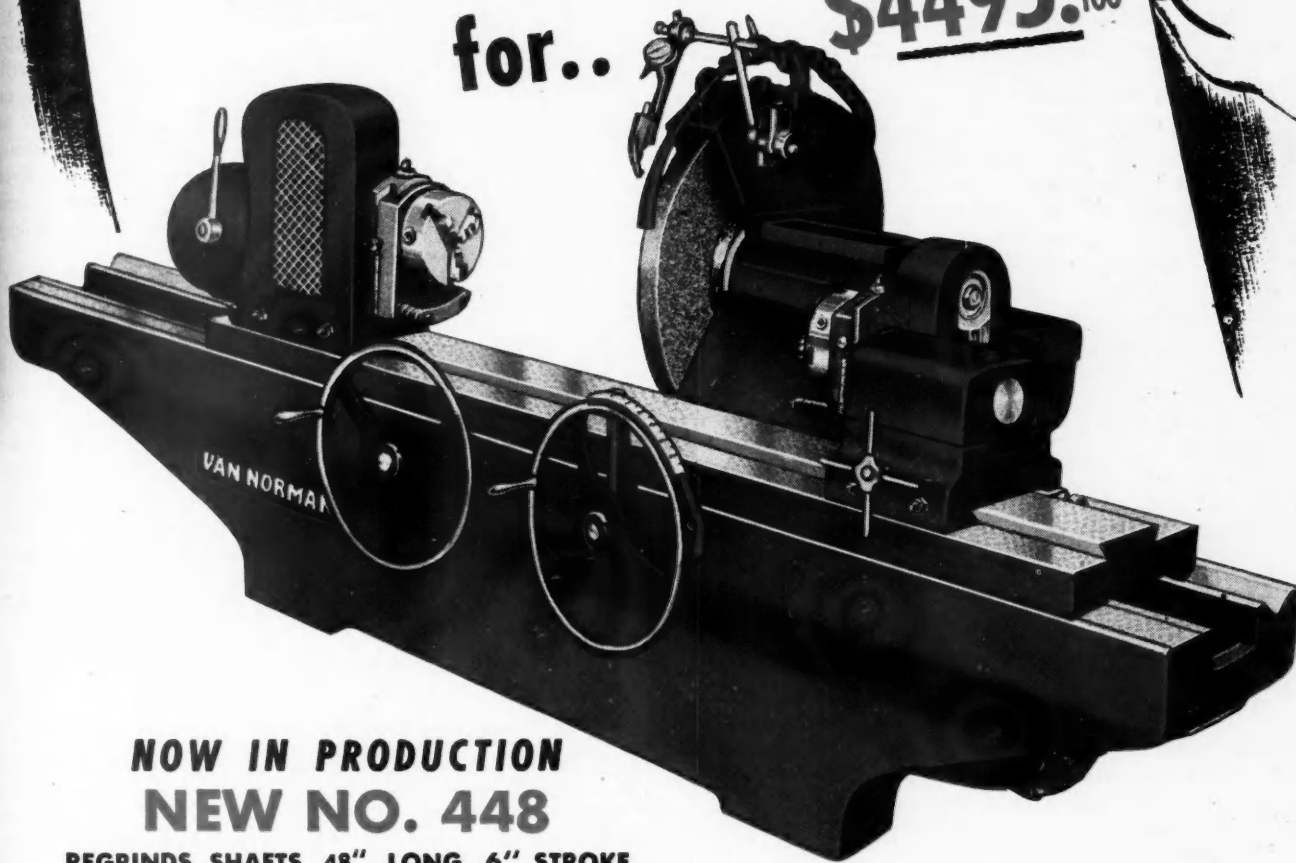
NOW you
can buy a

VAN NORMAN

Crankshaft Regrinder

for..

\$4495.^{00*}/₁₀₀



NOW IN PRODUCTION NEW NO. 448

REGRINDS SHAFTS 48" LONG, 6" STROKE
... and gives you all these Van Norman-Engineered Features:

1: *Conventional Van Norman Design* — Work table traverses ... Ways are hand-scraped for Van Norman accuracy ... Close-grained cast-iron base has 3-point support ... and is deep-ribbed for the extra rigidity that means vibrationless operation.

2: Precision anti-friction bearings on the wheel spindle, headstock and tailstock spindles.

3: Standard equipment includes fixtures for grinding mains and pins between centers. 6" and 8" chucks are available, to eliminate re-centering of shaft.

4: NEW NO. 448 is fast, accurate, and easily operated. Has a 24" wheel. See your jobber *right now* ... or write now to Van Norman Co., Springfield 7, Mass.

*Price is U. S. price with standard equipment, FOB Springfield, Mass., and is subject to change without notice.

The Best-Equipped Shop
Gets the Business!

that's why

"It Pays to Van Normanize"



Conference Corner

Continued from Page 27

Most U. S. Drinking Water Is Suitable for Exide

by E. Grothe
Service Division Engineer
Electric Storage Battery Co.

We would prefer to use approved drinking water because it would be much cheaper to use than distilled water.

"The Electric Storage Battery Co. has analyzed local drinking waters for over 50 years to ascertain whether they might be used in storage batteries or not. This analysis work still goes on because it is well to check every several years to be sure that the quality of the local drinking water has not changed for any of several reasons. With all these facts behind it, we can say that most of the local drinking waters in the U.S.A. are suitable for use in Exide Batteries."

Water Containing Minerals Will Injure Battery

by Dave Hinman

The Goodyear Tire & Rubber Co.

agent harmful to normal battery action, is considered acceptable. Particular care should be taken to make certain the water used does not contain minerals, alkalies or other chemicals that might either neutralize the battery's sulphuric acid content or injure its plates and separators.

"Any water not crystal clear and having a noticeable taste or odor should be particularly avoided unless known to be safe for battery use.

"If the battery dealers of a community make it a practice to use the regular tap water provided, in filling batteries, it may be considered reasonably certain that this water is satisfactory for this purpose."

Pure Drinking Water Is Satisfactory

by H. D. Wilson
Chief Engineer
Battery Division

Electric Auto-Lite Co.

"We agree with the recommendations provided in the AABM manual but generally we prefer to make the recommendation for distilled water as an alternate to the use of approved drinking water rather than the first choice.

"Battery manufacturers agree that distilled water is safest for use in all batteries, since this leaves no doubt as to the question of purity. Generally speaking, however, any water which has been analyzed, found fit to drink and free from any

"The attitude of the entire battery industry is accurately stated in the 'Battery Service Manual,' revised Second Edition, published by the Association of American Battery Manufacturers, and distributed by members.

"Drinking water of the sort described on Page 22, under section 'Pure Water and Its Storage,' of the Manual, contains so few harmful metallic impurities, and in such small amounts, that their effect on self-discharge in the cells is so slight, compared to the current being put through the battery by the generator, that they can be ignored.

"Distilled water may be used to some advantage in large industrial stand-by cells which are charged only at infrequent intervals and where power costs are a controlling factor. In automotive service, however, where the generator is capable of keeping the battery charged at all times, the effect of impurities introduced by the use of crystal clear, tasteless, odorless drinking water is so small that it may be ignored."

Use Distilled Water or Its Equivalent

by O. H. Bauer
Chief Chemical Engineer

Bowers Battery & Spark Plug Co.

If this should happen, the exposed portion of the plates may be permanently injured.

"The average tap water may contain only small amounts of impurities which in these quantities would not cause any appreciable deleterious effect. However, it is the accumulation of these impurities over a period of time which will weaken the various components in the cell, namely, the plates and separators.

"A source of pure water consists in the collection of rain into glass, stone or hard rubber containers. This water should not have been in contact with iron or copper drains. Some fleet owners take advantage of melting snow, in suitable containers, and storing away for future use. A lid should be placed on each container to prevent outside contamination. This idea would seem to be very practical in certain localities."

Distilled Water Only Is Safe to Use


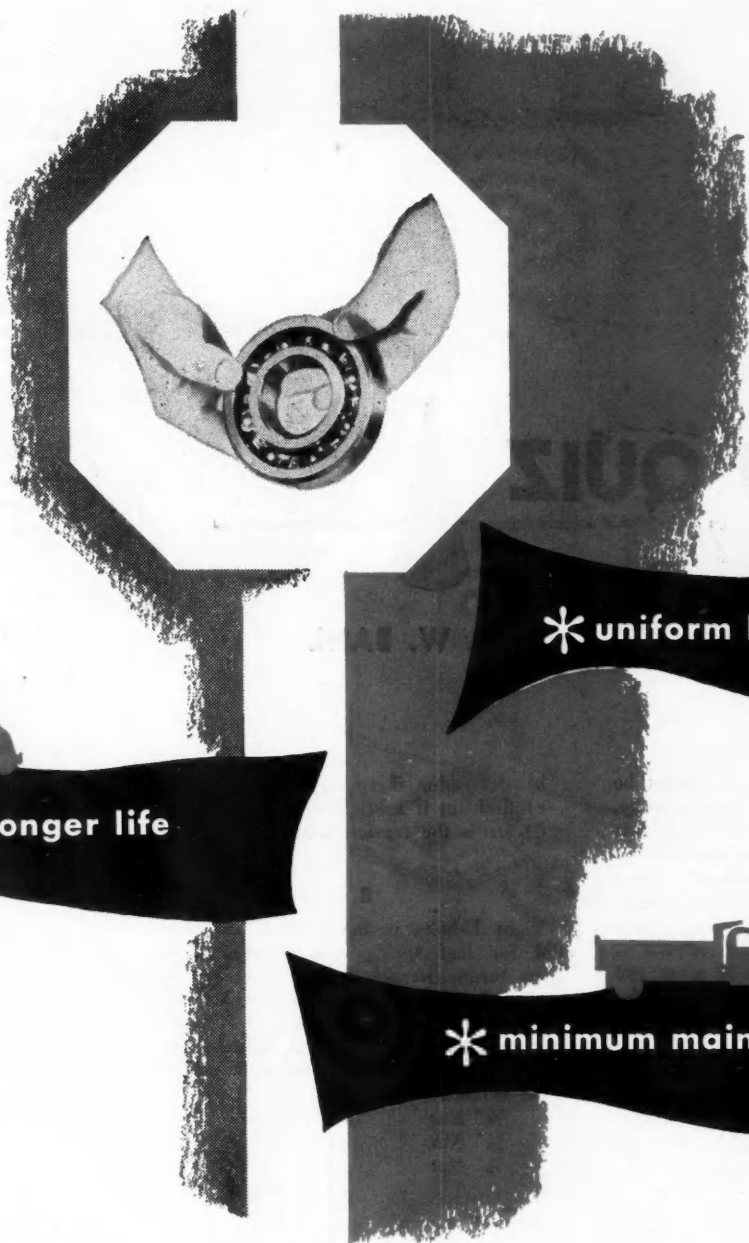
by Leo Dubinski

Standard Electric Co.

storage battery. Using other than distilled water one or two times might not be very injurious to a battery but continued use of other than distilled water will almost invariably result in an accumulation of chemicals and minerals in the battery cells which will be detrimental to the plates and thereby shorten the life and diminish the serviceability of the battery.

"When a liquid evaporates, all of the chemicals and minerals which it contained are left behind. By using other than distilled water in a battery, these foreign matters continue to build up to the point where they are injurious. In view of the above, we recommend only distilled water be used to replace evaporation in storage battery cells."


(TURN TO PAGE 238, PLEASE)



* uniform high quality



* longer life



* minimum maintenance

all three * with **SKF** Deep Groove Ball Bearings

More and more fleet owners are replacing interchangeable bearings on transmissions . . . wherever a shaft turns . . . with **SKF** Deep Groove Ball Bearings.

They are getting lower mileage costs and better maintained schedules from these rugged **SKF** Deep Groove Ball Bearings.

Close contact between the balls and the deep continuous groove in each ring, enables the **SKF** Deep Groove Ball Bearing to sustain, in addition to radial load, a substantial thrust load in either direction . . . even at very high speeds. Check your **SKF** Distributor, he has a stock of these bearings. **SKF** Industries, Inc., Philadelphia 32, Pa.

6571



Automotive Bearings engineered by

SKF



by G. W. BAHL

Encouraging thought—Spring cannot be more than a few cold wave lengths away. So, before you can recoil we'll dangle this new crop of questions before you and see how fast you are on the rebound. Seven Correct shows you have a little bounce, eight out of 10 is average, nine correct answers indicate you do not require a helper (spring) and 10 for 10 gives you a mainspring rating. Check page 170 for the answers.

1

Practically all leaf springs used on commercial vehicles are the

- a) cantilever type
- b) semi-elliptic type
- c) full elliptic type
- d) volute type

2

Some leaf spring manufacturers test every assembled spring in a "bull dozer" to

- a) check U-bolt spacing

JOBSERVATIONS

by Buster Rothman

Hats off to the past: coats off to the future!

When you see a man on top of a mountain—he didn't light there, he had to climb.

Lucky is the man who does not believe in luck.

You need more than a chisel to build a successful business.

This is often the key to the loser's fate: he ran fast enough, but he started too late.

A wise man makes more opportunities than he finds.

- b) determine if spring eyes will open
- c) find out if lubrication is necessary
- d) stress the tension side of the leaves

3

Tight U-bolts is the keynote of good PM for leaf springs. In absence of a large torque wrench, socket wrenches of correct handle length work satisfactory. The recommended handle size for the U-bolt nuts shown on the left below is in the choices at the right. You must get all three correct.

- | | |
|---------------------|------------|
| $\frac{5}{8}$ " Nut | () 2 foot |
| $\frac{3}{4}$ " Nut | () 3 foot |
| $\frac{7}{8}$ " Nut | () 4 foot |
| | () 5 foot |
| | () 6 foot |
| | () 7 foot |

4

The eyes of a good leaf spring should not open up. The best combination is

- a) both eyes up
- b) one eye up and one eye down
- c) both eyes down

5

Spring companies use three of the following SAE grades of steel for leaf springs. Check those which are not correct.

- | | |
|-------------|-------------|
| a) SAE-3130 | d) SAE-6150 |
| b) SAE-4140 | e) SAE-6260 |
| c) SAE-5150 | f) SAE-9260 |



These pithy epigrams are worth their weight in gold if used properly in the fleet field. We suggest that these messages be reproduced in large type—on the blackboard or on the shop bulletin board — or used in letters and news bulletins to employees.

6

Some fleets hot stamp the numeral 1 on the spring to indicate the first repair, 2 for the second, etc. Experience indicates it is advisable to replace the entire spring after the

- | | |
|---------------|---------------|
| a) 2nd repair | d) 5th repair |
| b) 3rd repair | e) 6th repair |
| c) 4th repair | |

7

"Accidents due to spring failure are generally inexcusable."

True () False ()

8

U-bolt tightness is stressed because

- a) it correctly aligns the spacer pads
- b) it adds longer life to the spring clips
- c) it prevents leaf breakage
- d) it maintains correct spacing for backing plates

9

All U. S. Army vehicles, from jeeps to light tanks, used the "military wrap" of the spring eyes to

- a) provide equal riding comfort for the lightly loaded or fully loaded vehicle
- b) prevent variation in deflection from light load to heavy load
- c) insure operation of the vehicle when main leaf is fractured
- d) eliminate lubrication of the leaf springs

10

Mark true or false in front of the following statements. Four correct answers will give you 10 points.

- () Percentage of main leaf breakage can be reduced by decreasing thickness of main leaf
- () Spring clip bolts should be installed with head of bolt away from tires
- () Front axle caster is usually corrected by removing shims between the spring and axle pad
- () Heat treating can restore 50 per cent of original life
- () Lubricant applied by manufacturers to contacting surfaces is grease and graphite.
- () Using the same amount of metal, a 9-plate spring will carry less load than an 11-plate spring

DRIVE SLOWGANS

by Buster Rothman

If you're Hell-bent—don't insist on company.

Drive right so more people will be left.

School zone sign:

"Drive slowly, obey instructions, We love our little tax deductions."

Who drinks before he drives is putting the quart before the hearse.

Railroad crossing sign:

"If it's a tie you lose."

Don't make some Kid the Goat for your Carelessness.

BOSS, IT'S SURE
A LONG TIME SINCE
WE HAD ANY
TROUBLE WITH
ENGINE JOBS

NOT SINCE WE
STARTED TO USE
PEDRICKS !



It's AMAZING how Pedrick piston rings help make *all* engine jobs come out right! "Heat-Shaping" does it. It takes *heat* to remove the stresses and strains set up in every ring by factory machining operations. It takes *heat* to make rings that will remain perma-

nently correct in shape and tension!

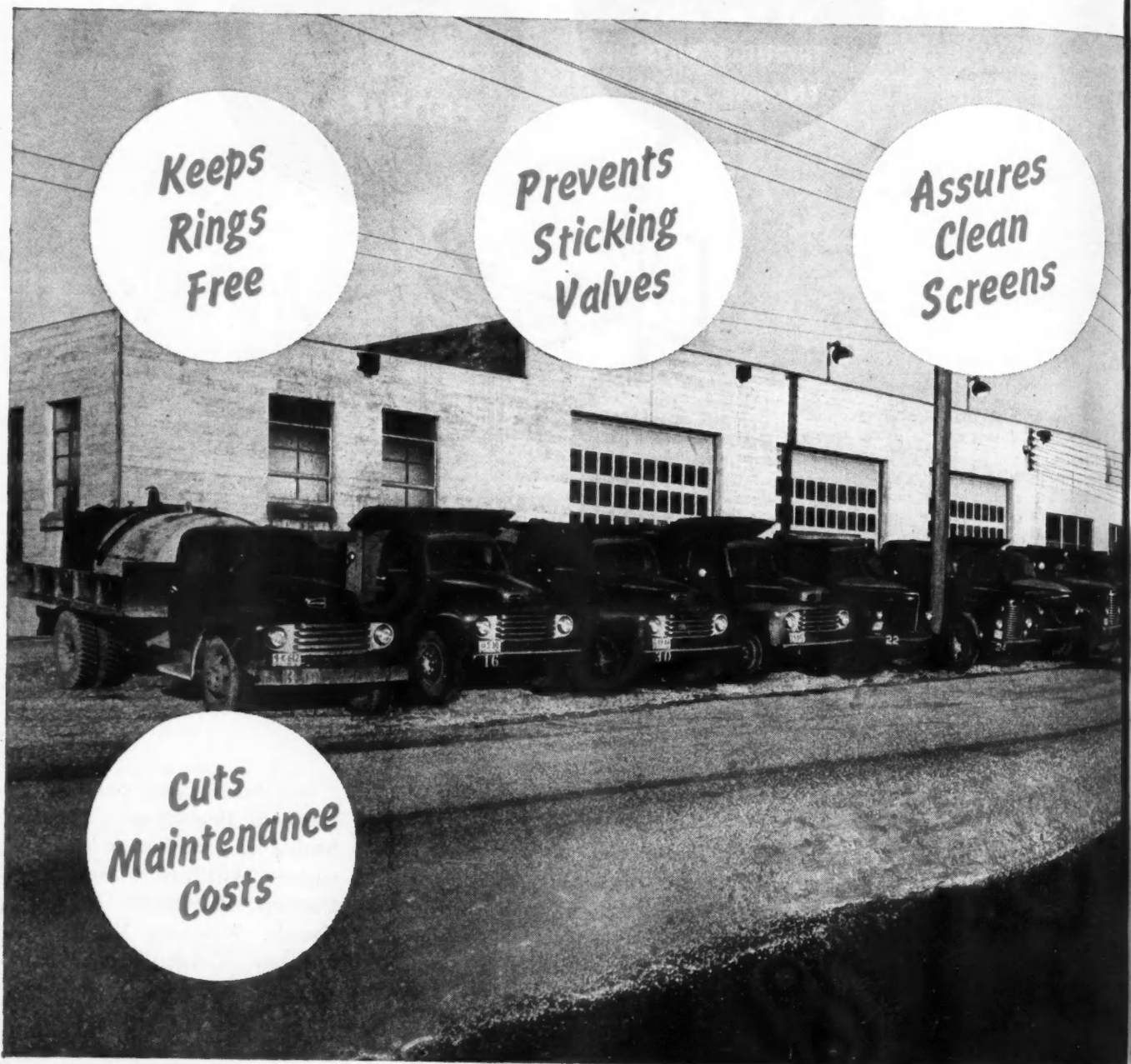
Because Pedrick piston rings are "Heat-Shaped," they fit better. They remain efficient for extra thousands of miles. In addition, they show greater resistance to sticking or warping in service.

No other ring gives you the advantages of "Heat-Shaping" in overhauling light, medium, or heavy-duty engines. WILKENING MANUFACTURING COMPANY, Philadelphia 42, Pa. *In Canada:* Wilkening Manufacturing Company (Canada) Ltd., Toronto.

FOR 29 YEARS, SUPPLIER OF PISTON RINGS TO LEADING VEHICLE AND ENGINE MANUFACTURERS

ONLY **Pedrick** PISTON RINGS ARE "HEAT-SHAPED"

SINCLAIR TENOL Engines Clean



Part of the 30-Truck Fleet of the Southwestern Portland Cement Company of Osborn, Ohio, users of Sinclair TENOL

SINCLAIR

YOUR NEAREST SINCLAIR AGENT WILL GLADLY ARRANGE



CCJ

NEWSCAST



INDIANA LIBERALIZES SIZES AND WEIGHTS

Governor Henry F. Schricker of Indiana has signed a bill, effectively immediately, permitting maximum gross vehicle weights of 72,000 lb instead of the previous 50,400 lb and increasing permissible lengths of combinations from 40 to 50 ft. Height limitations are also increased from 12 feet to 12 feet 6 inches with the provision that automobile transports may have a maximum height of 13 feet 6 inches.

The bill authorizes the State Highway Commission to designate certain highways as heavy-duty highways over which the maximum loads together with increased axle loads may be carried. The maximum single axle weight in such instances has been increased to 22,400 lbs and the maximum for each axle of the tandem assembly to 18,000 lb. For other type highways (not designated for heavy-duty use) the axle limits for all types is 18,000 lb. The new act eliminates the previous formula of 700 (L+40).

The bill also provides for increased truck fees to become effective on January 1, 1950.

WILLYS CUTS ALL PRICES

Willys Overland Motors, Inc. has reduced prices of all cars and trucks by amounts ranging from \$25 to \$270. Detailed reductions are as follows:

- Panel delivery, \$155
- 2-wheel-drive truck, \$130
- 4-wheel-drive truck, \$30
- 4-cyl. station wagon, \$150
- 6-cyl. station wagon, \$140.
- 6-cyl. station sedan, \$145
- Jeep, \$25
- Jeepster, \$270

MARTIN LARSON NAMED DRIVER OF THE YEAR

Martin Larson, 41-year-old driver for Indianhead Truck Line, St. Paul, Minn., has been named the trucking industry's Driver of the Year by an independent panel of three judges who screened nominations from all parts of the country. Larson was picked because of an 18-year record of driving without an



DATES AND DOINGS

APRIL 11-15—Fleet Supervisors Training Course, University of Connecticut, Hartford.

APRIL 15-16—Louisiana Motor Transport Assn. 9th Annual Convention, Washington-Youree Hotel, Shreveport, La.

APRIL 18-22—Fleet Supervisors Training Course, University of Michigan, Ann Arbor.

APRIL 25-29—Fleet Supervisors Training Course, University of Wisconsin, Madison, Wis.

APRIL 25-29—Fleet Supervisors Training Course, University of Maryland, College Park, Md.

MAY 2-6—Fleet Supervisors Training Course, Iowa State College, Ames, Iowa.

MAY 9-13—Fleet Supervisors Training Course, S. D. State College, Brookings, S. D.

MAY 9-13—Council of Safety Supervisors and Equipment and Maintenance Council, ATA, Annual Spring Meeting, Melbourne and Sheraton Hotels, St. Louis, Mo.

MAY 16-20—Fleet Supervisors Training Course, Northeastern University, Boston, Mass.

MAY 19—Rhode Island Truck Owners Assn. Annual Meeting, Narragansett Hotel, Providence, R. I.

MAY 19-21—Washington Motor Transport Assn. Convention & Truck Roadshow, Olympic Hotel, Seattle, Wash.

MAY 28-31—Texas Motor Transport Assn. Annual Convention, Buccaneer Hotel, Galveston, Texas.

MAY 30-31, JUNE 1—Mid-year meeting, National Tank Truck Carriers, Inc., Hotel Cosmopolitan, Denver, Colo.

JUNE 1-3—President's Highway Safety Conference, Departmental Auditorium, Washington, D. C.

JUNE 3-4—Associated Motor Carriers of S. D., Annual Convention, Hotel Carpenter, Sioux Falls, S. D.

JUNE 5-10—Society of Automotive Engineers, Summer Meeting, French Lick Springs, Ind.

JUNE 6-10—Fleet Supervisors Training Course, University of Richmond, Richmond, Va.

JUNE 16-17—Fleet Supervisors Training Course, Penn State College, State College, Pa.

JUNE 20-24—Fleet Supervisors Training Course, Marshall College, Huntington, W. Va.

JUNE 25—Pennsylvania Motor Truck Assn. Annual Meeting, Penn Harris Hotel, Harrisburg, Pa.

JULY 4-8—Fleet Supervisors Training Course, Northwestern University, Evanston, Ill.

JULY 11-15—Fleet Supervisors Training Course, Gonzaga University, Spokane, Wash.

JULY 18-22—Fleet Supervisors Training Course, Montana State College, Bozeman, Mont.

OCT. 15-20—Baking Industry Exposition, Municipal Auditorium, Atlantic City, N. J.

OCT. 21-26—American Trucking Associations, Inc., Annual Convention, Hotel Statler, Boston, Mass.

accident, combined with a highway rescue of a motorist pinned in his overturned car in below-zero weather.

The American Trucking Associations, Inc., sponsor of the nation-wide contest, announced Larson will receive an all-expense trip to Washington and New York, and a Norge deep-freeze unit filled with Birds-Eye frozen foods, gift of the American Bantam Car Co.

Contest judges were Major General Philip B. Fleming, Federal Works Administrator, chairman; A. W. Bohlen, executive director, American Association of Motor Vehicle Administrators, and Arthur C. Butler, director, National Highway Users Conference.

Larson is a member of Local 975, International Brotherhood of Teamsters. He is married and has five children.

OLSON BODIES REDUCED

The J. B. E. Olson Corporation has advised that effective immediately the manufacturer's list price on its Model T3-9 Kurb-

Size package delivery body has been reduced by \$170.00. The body is designed for the Chevrolet forward control chassis and is distributed by Chevrolet dealers exclusively.

TANK CARRIERS SHIFT MEETING TO DENVER

Advance indications of heavy attendance at the mid-year meeting of the National Tank Truck Carriers, Inc., a conference of the American Trucking Associations, Inc., have caused the group to shift its meeting place to the Cosmopolitan Hotel, Denver. The sessions will run from May 30 through June 1.

C. Austin Sutherland, secretary-manager of the conference, said the meeting had been planned originally for the Broadmoor Hotel at Colorado Springs but that advance registrations indicated attendance would be beyond its capacity. In order to assure adequate space for the business sessions and for the many delegates expected to bring their families, it was deemed advisable to hold the meeting in Denver.

(TURN TO PAGE 227, PLEASE)

IT'S 10,000 MILES A DAY ON Firestone TIRES

For STONE'S EXPRESS • New York City and Boston

Since Stone's Express was organized in 1910 we have developed a service that handles everything from light delivery to fast, over-the-highway freight. All our equipment is now on Firestone Tires because they cut our costs and the Firestone people give us good service.
(signed) J. B. Moore, President
Stone's Express, Inc.



J. B. Moore, standing, president of Stone's Express, Inc., watches Firestone's New York City District territory manager, Ralph Handler, check a Firestone CC Highway tire for tread wear.

TRANSPORT

CC HIGHWAY

WIRE CORD

STONE'S EXPRESS, a fleet of 457 pieces of equipment in New York City and Boston, rolls up a total of 10,000 miles every day on Firestone Tires. On Stone's light delivery trucks . . . on the big highway tractor-trailer units — over 2400 wheels in all — the tire equipment is Firestone . . . the right Firestone Tire for the load, road and condition of service.

Stone's Express uses Firestone Tires exclusively for two reasons:

1. Firestone Tires give lower-cost mileage.
2. The Firestone tire men give better service.

This, of course, reduces expenses and means a more profitable operation.

This Firestone combination of lower-cost mileage and better service will help you cut operating expenses and show a better profit. Your Firestone Dealer or Store is ready to prove it to you any time. Give him the go-ahead . . . and let him show you.

Listen to the Voice of Firestone every Monday evening over NBC and Americana over NBC Network Television Stations

Copyright, 1949,
The Firestone Tire & Rubber Co.

FIRESTONE TRUCK TIRES
for Every Load, Road and Condition of Service

E

AIRLIE

"E"

Roundup of

RECENT TRUCK HARDWARE DEVELOPMENTS BY EBERHARD

5552

5624-52

5624

5621

5605

5603

5685

166

575717

565694

4877

5625

Eberhard designers, and engineers have corralled sound engineering ideas and rugged construction to offer particular body builders the latest in "purpose tested", long run truck body fittings.

Styled in keeping with today's body design trends, the Circle E line will merit your investigation.

Your copy of this comprehensive Eberhard Catalog is available by writing TODAY. It will prove a helpful guide when specifying and selecting truck hardware.

EBERHARD
Hardware
FOR
TRUCKS
TRAILERS
BUSES
TAXICABS
ETC.

EBERHARD Long Run
TRUCK BODY FITTINGS

E

EBERHARD MANUFACTURING CO.

Division of the Eastern Malleable Iron Co., 2734 TENNYSON ROAD, CLEVELAND, OHIO

LAUGH IT OFF



The Chaplain for the trucking company was addressing the maintenance personnel at one of their weekly gatherings. During the course of his talk, he told the gathering about King Solomon. After he had described Solomon's temples and palaces, he told them of his thousand wives and how he fed them all on Ambrosia. At this point, one of the grease monkeys in the crowd, who was not a possessor of a great amount of tact, said, "Never mind what he fed THEM, what did Solomon, himself, eat?"

CCJ

MY SECRETARY QUIT TODAY,
IT CUT ME LIKE A KNIFE,
SHE CAME BACK EARLY FROM HER LUNCH
AND SAW ME KISS MY WIFE.

CCJ

The automotive parts dealer had just become the father of twins. He was in a terrible predicament. He couldn't tell the babies apart. There wasn't any way to identify them. He couldn't cut their hair differently because they didn't have enough hair to cut. Their eyes were the same shade; their chubby noses the same; he was just out of luck. Finally he had an inspiration and had their names tattooed on their backs: "Daisy and Bill."

CCJ

CATTY CORA SAYS: "NO MATTER HOW LIGHTLY OPPORTUNITY KNOCKS ON A PRETTY GIRL'S DOOR, HER LANDLADY WILL HEAR IT."

CCJ

The prim, elderly, Quaker lady was driving a shiny new car. Suddenly at an intersection a bus collided with the car, crumpling a fender, breaking a window and gouging a hole in its shiny side. Infuriated, the woman managed to control herself only by remembering her Quaker upbringing. Trembling, she got out and walked over to the bus driver.

"When thee gets home to thy kennel to-night," she said, "I hope thy mother BITES thee!"

The traffic rate clerk in a state of joyful inebriation came sailing merrily into the City Hall, and dropped anchor before the window of the Registrar of Births and Deaths.

"Good morning, gentlemen," he sang out: "I wanna register the birth (hic) of twins."

"Why do you say 'gentlemen'?" asked the man behind the window. "Can't you see I'm alone here?"

"Alone?" shouted the astonished rate clerk. "Only one of you? Then I'd better go home and take another look. Maybe it isn't twins (hic) after all."

CCJ

Wearily the road mechanic pulled to a stop in front of his favorite all-night eatery, just as a group of truck drivers exited and headed for their rigs. Slumping tiredly at the counter, he ordered "mud and sinkers."

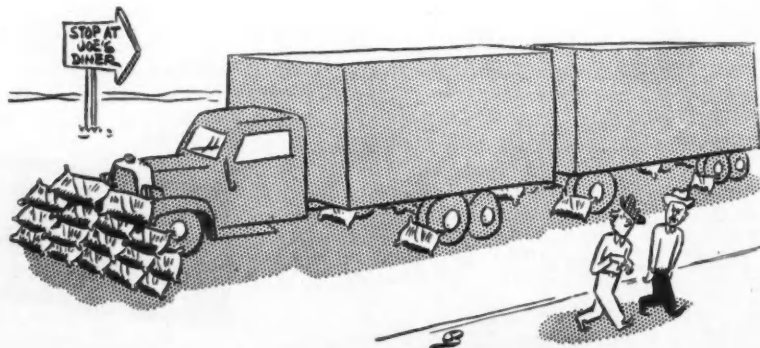
"I'm awfully sorry," said the waitress, "but the coffee is exhausted."

"I've been expecting it," growled the road man; "it's been getting weaker and weaker every time I stop."

CCJ

Telephone Operator: "I'm sorry sir—that number has been taken out."

Shop Foreman: "Zat so! Well, can you give me any information as to WHO has been taking her out?"



"All right—so one got away from you one time!"

Thinking she recognized her husband, a lady in a suburban bus suddenly left her seat and from behind put her arm around a man sitting several seats ahead. She was greatly embarrassed when the man turned around and she saw that he was a perfect stranger.

"Pardon me," she tried to explain, "but you see, your head behind looks exactly like my husband's behind."

CCJ

Safety Sadie says: "No wonder the tired business man gets that way. Eight hours a day he plays ball, shoots the works, greases the skids, knocks 'em dead, pushes his line, pulls in his horns, holds his own, hangs on, digs down, coughs up, follows through, hits hard, goes overboard and cashes in."

CCJ

The garage operator had gotten so bad that he finally decided to appeal to Alcoholics Anonymous for aid. But before he did, he decided to have one last spree. While in the throes of his glorious toot, he insisted to friends that he had swallowed a horse. Jokingly, they called in a doctor who, in a pampering mood, agreed to operate and remove the horse. The garage man was given ether and while he was unconscious momentarily, someone led a large black horse into the room. The patient came to and the doctor pointed to the horse. Shaking his head the garageman said: "That isn't the one I swallowed. It was a white one."

CCJ

It was a very chilly day and the sweet young thing stalled her car at a traffic light. She stamped her little pinkies on the starter, tried again, choked her engine, but to no avail. Behind her Weavin' Willie, with a load of high-priority freight to be delivered, honked his horn steadily. Finally, she got out and walked back.

"I'm awfully sorry, but I don't seem to be able to start my car," she told Willie, pleasantly. "If you'll go up there and start it for me, I'll stay here and lean on your horn."

CCJ

Professor: "If molecules can be split into atoms, and atoms broken up into electrons, can electrons be split up any further?"

Claim Agent's Son: "Well, professor, you might try shipping them in a package marked 'Fragile.'"

RESUME WORK

PERCENTAGES BY WHICH PUROLATOR MICRONIC ELEMENT EXCELLED COMPETITIVE TYPES

COMPETITOR	IN AVERAGE DIRT RETENTION PUROLATOR LED BY:
A	199%
B	220%
C	113%
D	547%
E	164%
F	619%
G	255%
H	339%
I	318%
J	193%
K	237%

AVERAGE PUROLATOR SUPERIORITY 290%

"I'm deaf to wild claims — give me Purolator's proof of greater engine protection!"

● Take a look at the facts . . . see why the new Purolator Micronic oil filter is the answer to a maintenance superintendent's prayer.

Purolator tops all competitive types by removing 3 times as much carbon, grit, metal particles and other harmful abrasives from the oil stream before they can reach fleet

engines and score pistons, bearings, cylinder walls and other vital parts.

And here's the key to this sensational performance.

Purolator's new, exclusive *micronic* element, made of cellulose specially impregnated with plastic, is molded into an accordion-pleated form that filters particles as tiny as .000039 of

an inch . . . has a filtering area 5 times that of old-style filters.

So why court engine trouble and lost trucking time . . . when there's a Purolator Micronic Refill for almost every make filter! Contact your nearby Purolator distributor today and let him equip your entire fleet with Purolators before trouble strikes!

PUROLATOR PRODUCTS INC.
Newark 2, New Jersey
and Windsor, Ontario, Canada



PUBLICATIONS

FREE



L10. Truck and Bus Tires

Here is information and technical data to assist in the selection of tire equipment best adapted to insure the lowest possible operating cost for every type of service. This 76-page manual on truck and bus tires should be made available to every shop.

This is more than just a tire reference book. It is a complete manual featuring such pertinent information as Application Analysis, Facts on Tire Changeovers, Complete Rim Information, and Service Tips.

Detailed information is outlined on load distribution for all types of commercial vehicles. Data on wheel and rim changeovers include tables on side clearance, chain clearance, brake drum clearance, body and fender clearance, and other information.

Under service tips the author discusses methods of proper loading, correct speed load ratios, proper tube mounting, etc. Full-page charts show the effect of overloading on tire service, the effect of inflation on tire service, the effect of temperature on tread wear, effect of speed and temperature on tread wear, and recommended tire installation practice.

This manual will be found valuable in any fleet—many times a day. Just write L10 on the free postcard.

L11. Tapered Bearings

A pocket-size booklet on the care and maintenance of Timken tapered roller bearings is just off the press, ready for distribution to the fleet field. Containing 20 full pages of practical information on bearings, this booklet takes up such subjects as front wheel, propeller shaft, axle carrier, pinion, differential, transmission bearings to show adjusting techniques. Under lubrication such sub-

USE POSTCARD NO STAMP NEEDED

A selected list of the latest literature —
catalogs, pamphlets, charts—chosen to help
fleetmen improve operation and maintenance

jects as general requirements, specifications and extreme pressure lubricants are discussed. And finally care in handling and assembly receives attention. Practical tips on bearing inspection prior to replacement will be useful to the mechanic, while torque and various types of shim adjustments will enable the operator to obtain long life and satisfactory service from these assemblies.

Write L11 on the free postcard for a copy of this bearing guide.

L12. Brake Service

Modern Brakes is the title of this 24-page booklet featuring a guide to fundamentals, operating principles and adjustments of various types and models of hydraulic brakes.

This booklet with carefully designed drawings and text shows the mechanic exactly how to make adjustments of the unit. Information on relining shoes is also provided. Data covers the Bendix two shoe mechanical brake, single and double anchor, the single and double piston hydraulic brake, the Lockheed models, Wagner self-adjusting types, Huck mechani-

cal and hydraulic, and Ford brakes.

The last section of the book covers causes of brake troubles, with such conditions as low brake pedal, spongy pedal, brake noises, erratic braking, dragging, etc., discussed in detail.

This is your guide to better brake service. Write L12 on the free postcard and make this publication available to all mechanics.

L13. Undercoaters

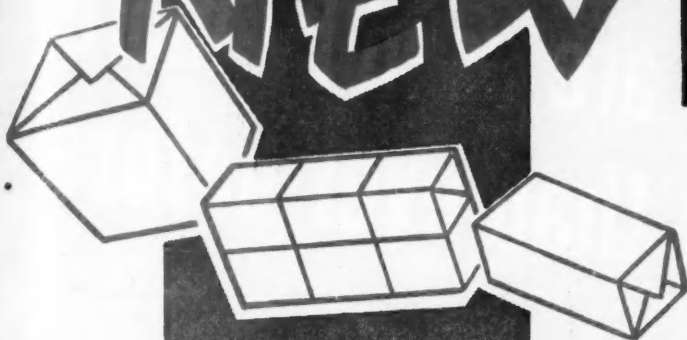
A new 40-page booklet, "Witcotes: Asphaltic Mastics," lists a wide variety of asphaltic products available and gives their properties and uses. The booklet is divided into various sections covering automotive undercoatings, sand-filled and sandless deadeners, flame-proof deadeners, sealers, rust preventives, box coatings, asphaltic paints, and railway mastics.

This booklet should be of great interest to anyone seeking an inexpensive yet effective protective material, and especially to those who have sound deadening problems.

Copies of this booklet may be obtained by writing L13 on the free postcard.

NEW

PRODUCTS



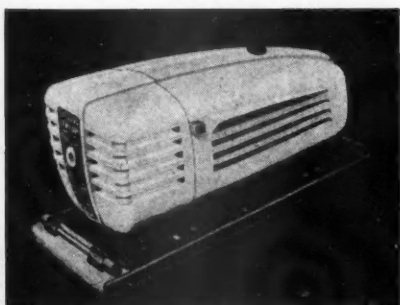
USE POSTCARD FOR MORE DETAILS

Illustrating and reviewing briefly many of the newest developments in parts, accessories, shop equipment and tools. For more information mail free postcard

P186. Portable Sander

Need a light-weight sander? The Century portable electric sander weighs only 4¾ lb and features a non-stalling high speed motor encased in a die-cast aluminum alloy housing.

Sander operates on the Orbital Mo-

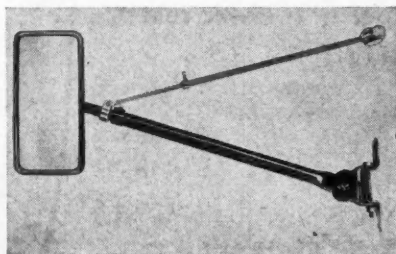


tion sanding action principle and is useful in feather-edging, removal of lettering, disk and file marks or sanding of surface. Sterling Tool Products Co., Milwaukee, Wis.

P187. Rear View Mirror

Here is a new type rear view mirror built around a combination of K-D's rectangular mirror and an arm

brace and bracket. Mirror arm is extra heavy steel tubing, has a reinforced extension joint and set screw and an extension of 15 to 27 in. Arm has a black enamel finish and features non-slip elevation and adjustment. The bracket has six holes



for extra support. Fits door hinges 1¾ to 2⅝ in. K-D Lamp Div., Noma Electric Corp., Cincinnati, Ohio.

P188. Floor Cleaner

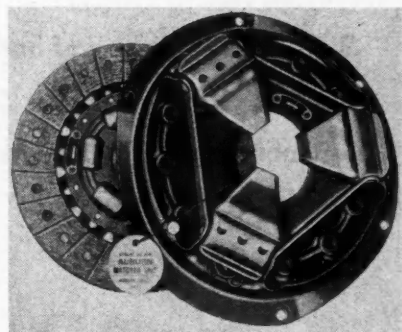
The new, improved Sol-Speedi-Dri, which absorbs floor greases and oils is more absorbent, makes larger areas of slippery floor safe because it is fluffier, has 10 per cent greater bulk per pound. Safety & Maintenance Co., Inc., New York, N. Y.

P189. Transmission Filter

A new transmission oil filter that continuously cleans gear oil of grit, grime and abrasives is designed for use on Fuller transmission, and most other makes as well.

Consisting of a stamped housing with a replaceable filter element, the new oil filter can be attached to all transmissions equipped with standard SAE six-bolt, short-length power take-off openings. Gear oil is kept clean during the interval between changes, resulting in longer life of bearings, bushings and transmissions. Fuller Mfg. Co., Kalamazoo, Mich.

P190. Chevrolet Clutch



When you replace your Chevrolet clutch, look into this design. This replacement clutch for Chevrolet cars and light trucks from 1938 through 1948 is a 3-lever adjustable type with six damper spring units round the hub of the plate to dampen out vibration and gear rattle. Cushion spring segments between the heavy-duty woven facings assure long service and smooth engagement. Soft pedal action is said to be attained through the use of three springs under each lever. Full torque capacity is provided by the action of these springs through the lever ratio of the release levers. The pressure springs do not contact the pressure plate and therefore run cooler and last longer, according to the manufacturer. The Auburn Clutch Co., Division of Dana Corp., Auburn, Ind. (TURN TO PAGE 52, PLEASE)

Why COOPERS are used by more truck owners than ever before

1. The combination of Rayon Cord and Distributed Stress Construction protects against tire-killing heat, load and road shock—guarantees better all-around tire performance on all types of trucking operations.

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 From Fleet Superintendent
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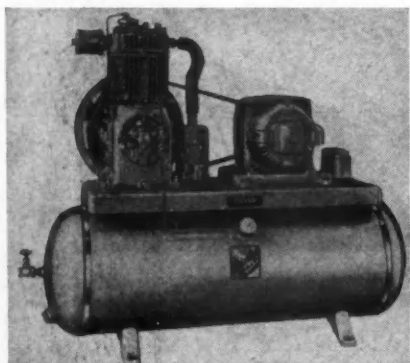
PRODUCTS

Continued From Page 49

P191. Block Repair

An after treatment of Zo-tite Block-saver is said to repair sand holes, hairline cracks, and wide open cracks in motor blocks. It has no injurious affect because it does not enter radiator or mix with anti-freeze. Block-saver should not be drained off when truck is put into service. The Zo-tite Products Co., Ozone Park, N. Y.

P192. 2-Stage Compressor



Six new models of two-stage air compressors have been added to Binks spray painting and finishing equipment. New models are designed to supply compressed air for spray painting as well as air at higher pressures than those normally used for spray finishing. In this way, the same compressor serves as a source of air for various uses. Compressors are built for 200 lb working pressure. Tanks are tested to 300 lb. Standard pressure setting is 160 to 200 lb. Special settings are also available. Displacements range from 7.13 to 40 cu ft per m. They are powered by motors ranging from 1½ to 10 hp. Units feature Timken main bearings, Lynite connecting rods, automotive-type pistons, non-breakable steel valves, copper-finned intercoolers, totally enclosed, dust-proof crankcase and a new combination intake air filter and silencer. Binks Mfg. Co., Chicago, Ill.

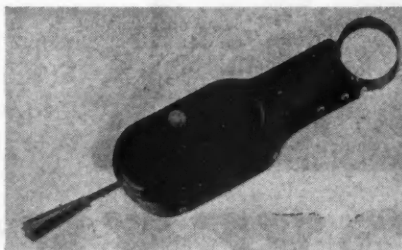
P193. Windshield Wiper

An advanced type of electric windshield wiper, available in 6, 12, and 24-volt models, features simultaneous operation of two wiper arms and blades with either tandem or opposed wiping motion, with a maximum wiping angle of 118 deg. Parking position is right or left hand for tandem operation; inside or outside for opposed operation. It has two-speed control—low speed of about 35 cycles per min., high speed of about 60 cycles per min.

Motor develops a torque of 30 lb. in. at each end in low speed. For a 6-volt unit, current draw at low speed is about 4.5 amp., while at high speed it draws only 3.5 amp. The manual switch used with the unit provides thermal overload control. American Bosch Corp., Springfield, Mass.

P194. Directional Switch

Check up on the operation of your turn signal lights. A new directional-light switch, which reports to the driver how his lights are working, is attached quickly and easily by a separate mounting bracket to a steering

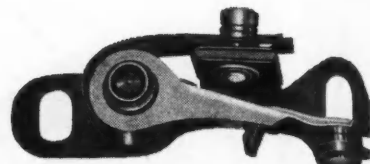


column of any size. Unit employs a jewel light in its top to signal failure of one or more bulbs in a directional-light system. An operating lever,

adjustable in and out, provides fingertip control regardless of the steering wheel diameter. Because a fuse is built into the switch, a short circuit will not affect the other lights on the vehicle. Arrow Safety Device Co., Mount Holly, N. J.

P195. Heavy-Duty Contact

A heavy-duty Contact Set for 1948-1949 Ford cars, Ford trucks and Mercury cars is now available. Prominent among the features of the



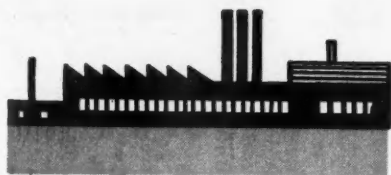
CS-749 Set is the use of .187 in. diameter tungsten, as opposed to .150 in. Other features include a stainless steel spring to prevent occasional breakage due to rust, and oversize bushing which permits greater accuracy in machining. Echlin Mfg. Co., New Haven, Conn.

(TURN TO PAGE 180, PLEASE)

P196. Tailgate Lift



The Heil loader, a self-contained hydraulic tailgate lift works like a freight elevator, lifts 2000 pounds from ground to a 50 in. height in less than 10 sec. A conveniently located control lever—at the right rear end of the truck body—may be operated from the ground or on the truck, starts and stops the tailgate, holds it at any intermediate position. The unit descends by gravity and stops automatically when it touches a platform, curb, or ground level. The absence of chains or other obstructions and the beveled, ramp-type lip of the 2½ in. thick platform makes it easy to load or unload bulky packages and crates either from the front or side. When loading operations are completed, the tailgate is closed and locked in position. The 900-lb unit is adaptable to any standard make of truck with 1½ tons or larger capacity. The Heil Co., Milwaukee, Wis.



Factory Service news

Briefed for Fleets From Manufacturers' Bulletins

Chevrolet Rear Spring Squeak . . . IHC Valve-Tappet Clearance . . . Federal Transmission Trouble . . . Studebaker Clutch Change . . . Plymouth Transmission Noise

Chevrolet

Rear Spring Squeak

A squeak located at the front end of the rear spring may show up at slow speeds on normal macadam roads. This may be caused by the inner sleeve of the inox bushing moving on the bolt and against the spring hanger. This may be the result of the through bolt being too long and bottoming on the inner end of the threads. Again, the through bolt may not be tightened to torque specification.

Install flat washers if necessary under the head of the bolt or nut. Torque the bolt to 60 to 90 ft lb. This will apply sufficient friction of the spring hanger against the inner sleeve of the inox bushing to prevent movement at this point. Do not apply lubricant to the inox bushing at the front end of the rear spring.

Door Lock Control

The truck door lock remote control assembly used on all 1947 models and early 1948 production models has been redesigned to increase the safety value of the mechanism. The new control assembly is available for service replacement and may be obtained under part numbers 3690223 left hand, and 3690224 right hand. With this new design it is necessary to pull the inside handle up to release the lock catch and open the door.

International Harvester

On BLD and RED engines some instances of excessive oil consumption can be attributed to too great a volume of oil being delivered to the valve rocker arms and valve stems. After a 15-min. idle, if the intake valve ports in head show an oil accumulation, an oil control clip, IH No. 80 319 R1, should be installed over the oil dam lubricant hole.

Valve Tappet Clearance

Some Stellite-faced exhaust valves require an increase of 50 per cent in valve tappet clearance. This will be noted on a tag affixed to the valve. When such valves are installed, an identification plate, IH No. 58 676 R1, should be made to the engine to give correct valve tappet clearance.

Since some Stellite-faced valves do not require this wider gap, a check should be made with a magnet when in doubt. If the valve stem is attracted by the magnet, additional clearance is NOT necessary. If the valve stem is not attracted by the magnet, increase clearance recommendation by 50 per cent.

Hand Brake Change—K-1, KB-1, K-2, KB-2, KB-3

The efficiency of the hand brake has been improved by rerouting the brake cable through the cowl instead of the toe board. To effect this change in the field, drill a $\frac{7}{8}$ -in. hole in the cowl and install rubber grommet IH No. 120 879 for rerouting the brake cable through the cowl. Drill a $\frac{9}{32}$ -in. hole in cowl for attaching brake cable to cowl, with clip IH No. 137 193. Install a loom $\frac{9}{16}$ -in. I.D. x 17 $\frac{3}{4}$ -in. length over conduit.

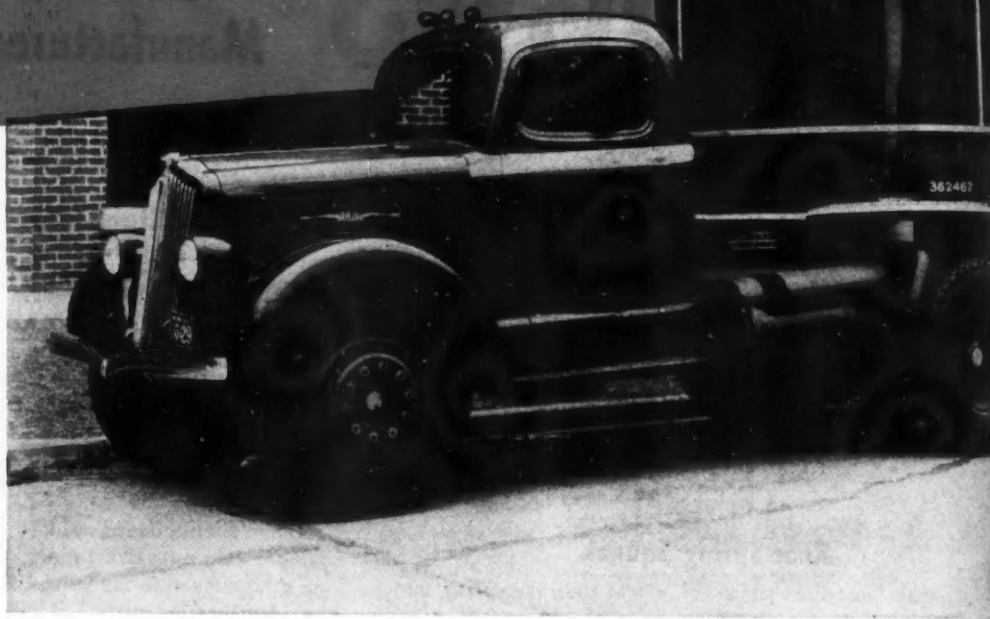
New BLD Bearings

Main and connecting rod bearings in BLD engines of Cleveland Graphite Bronze Co.'s Tri-metal 77 have replaced the same company's Tri-metal and S-metal bearings. The new bearing is an improved steel-back, copper-lead design with a surface layer of lead approximately .001 in. in thickness. The surface is not highly polished so that it aids in retaining the oil film during the initial stages of operation to aid engine break-in.

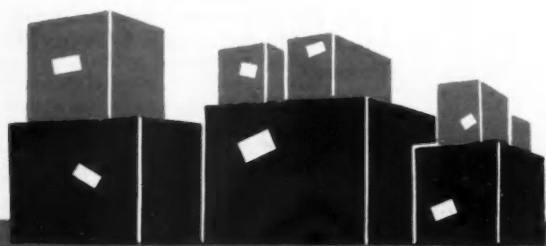
(TURN TO PAGE 61, PLEASE)

942 ALUMINUM TRAILERS

help Kroger cut Costs!



**Aluminum fleet saves
distribution dollars...**

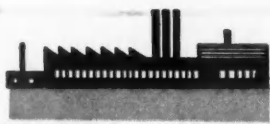


EXTRA PAYLOAD IS THE PAYOFF!

One reason the Kroger Corporation can feature attractive retail prices in their markets is *distribution economy*. One way they get it is by using lightweight aluminum trailers.

Kroger first used aluminum in trailer bodies over 20 years ago. Results were so successful that, in 1934, they bought their first all-aluminum monocoque semi from the Highway Trailer Company, Edgerton, Wisconsin. It's still in service! The trailer above is one of over 195 added to the Kroger fleet since the war.

Kroger keeps records. They've found that the



Factory Service news

Continued from Page 57

Federal Water Pump Seals

To correct chronic leakage in 1D1044 water pumps Hercules engineers have designed a new Synthane seal washer to replace the carbon washer. Part number of the new fabric washer is 1B6195.

Transmission—Models 16 and 18

The Warner T-9 transmission may jump out of fourth gear in subject models. When this trouble occurs, make the more simple checks first in locating and eliminating the trouble. Place jack under center of transmission, loosen clutch housing to flywheel housing capscrews $\frac{1}{2}$ turn, raise transmission and clutch housing assembly slightly and tighten the capscrews. Remove jack and road test to see if changing alignment of the main drive gear in this manner has corrected the trouble.

Shift transmission into all gears, getting the "feel" of the lever when fully engaged. If tension on the lever when shifted into fourth gear is less than in the other gears, this indicates insufficient tension of the mesh lock ball spring, or insufficient depth of the mesh lock ball groove in the shifter shaft.

Check fit of 3rd and 4th speed sliding gear on the main shaft. This should be done by measuring the "rock" of the gear which, when measured $1\frac{1}{4}$ in. from the main shaft, should not exceed .003 in. If rock of this gear exceeds .003 in. it should be replaced.

Check flywheel housing run out. Check housing to engine bolts for tightness and check housing for possible cracks.

FWD

"S" Transfer Assembly Lubrication

The transfer assembly is lubricated separately from the transmission, and contains its own filler, level and drain plugs. Use a straight mineral type of gear oil, which conforms with FWD specification No. T-46-1, to lubricate the assembly. Use SAE 90 for winter and SAE 140 for summer. Capacity is 8 qt. The full width of the transfer chain runs through the oil bath, in the lower part of the transfer case constantly, providing full lubrication of the chain and distributing oil to the other component parts of the assembly.

Diamond T

Tappet Adjustment, B6427 Engines

Field complaints of early exhaust valve failures and some breakage have been traced to excessive exhaust valve tappet clearance.

The main source of this excessive clearance is faulty installation of exhaust valve locks. On conventional type valves, it is practically impossible to install the valve locks improperly and not have the locks fall out. On the "Roto" type exhaust valve, it is possible to install the locks improperly and yet the cup on the end of the valve stem prevents their falling out.

Valve locks have been found to be setting on top of the cup and the taper of the valve spring seat holding the locks tightly against the valve stem below the groove. As the cup would not allow the locks to drop out, they would stay in place for a length of time of operation and then jump into their proper place which would give them an additional $\frac{1}{16}$ in. clearance. This extra clearance would cause valve burning and sometimes valve breakage.

Studebaker

Clutch Driven Plate Assembly

For the 2R5 and 2R10 3-speed transmission. This new clutch driven plate incorporates a change in the friction lag and is designed to eliminate possibility of gear rattle on propeller shaft ring on deceleration. Part No. 678905 should be used to replace clutch driven plate assemblies when truck is equipped with the 3-speed transmission. Clutch driven plate assembly on 2R5 and 2R10 4-speed transmission and 2R15, Clutch Plate, Part No. 666385, with the six green springs will be used.

Plymouth

Center Main Bearing Caps

Before removing No. 2 and 3 crankshaft bearing caps on Plymouth cars punch mark the caps and block so that caps are correctly installed in the same position and location. If the No. 2 cap is mixed with No. 3, the bearings will apparently fit, but it will be impossible to maintain the proper crankshaft alignment or bearing clearance. This may result in a bearing noise and in premature failure. Both center caps and the block itself are machined slightly off set, and when the caps are tightened, they will crack if installed backwards.

Noise at Left Rear Motor Mount

Fast starts in low gear may cause the engine to rock in its mountings, permitting interference of the lower metal washer of the left rear mount against the metal frame pocket. A satisfactory insulator may be cut from a flat piece of rubber $\frac{1}{16}$ in. to $\frac{3}{32}$ in. This insulator should be $2\frac{1}{4}$ to $2\frac{1}{2}$ in. in diameter with a $\frac{5}{8}$ -in. hole at the center. In re-installing, care should be taken not to overtighten the nut since this might collapse the spacer.

GILLETTE SUPER-RIBBED

Unique shoulder design throws off the heat. Special shock shields absorb sudden impact, guard against blowouts. Super Ribs keep hauling cost to a minimum, help keep schedules on time.



GILLETTE CONSTRUCTOR

Here's a tire that will carry the most massive loads. 60% greater tread depth withstands the most bruising wear. Self-cleaning lugs give sure traction. Shock shield construction gives extra inner strength. You get more power efficiency at low operating and maintenance cost.

From STOP-GO Delivery to the LONG HAUL **GILLETTE TIRES**

DO A BETTER JOB

...and at less cost per mile!

Whether you have a fleet for city delivery, long-distance hauling, or trucks for heavy construction work, there's a Gillette Tire to do a better job for you! Equipping all your trucks with Gillette Tires, is one sure way to help meet time and delivery schedules. Here's a top quality line of rugged tires designed to throw off heat faster, give long, smooth-rolling, fuel-saving miles. Your profits keep rolling in when your fleet keeps rolling on Gillette Tires! See your Gillette dealer today!

GILLETTE SUPER DELIVERY

With new, improved rayon construction for greater strength and less heat. 25% more tread depth wears evenly, slowly, protects against blowouts and punctures . . . you'll get up to 45% more miles at normal speeds.



GILLETTE TIRES

DIVISION OF UNITED STATES RUBBER COMPANY



WEAR LIMITS

A Practical Guide to Safe Use,
Repair & Replacement of Parts

Manufacturers of axles, brakes, clutches and engine parts have provided these valuable recommendations for limits of wear of units and assemblies, clearances and operating tolerances. While it is suggested that the mechanic refer to manufacturers' manuals for specific specifications whenever possible, the figures given here have been selected as practical for long mileages, proper operation and economy of maintenance.

PISTONS, RINGS, CYLINDERS

The following companies have provided information for this section: Aluminum Company of America, Hastings Mfg. Co., Koppers Co., Inc., McQuay-Norris Mfg. Co., Moog Piston Ring Co., Ohio Piston Co., Perfect Circle Corp., Ramsey Corp., Sealed Power Corp., Wausau Motor Parts Co., Wel-ver Piston Ring Co., Wilkening Mfg. Co.

Piston Ring Size

The correct ring size is determined by the smallest cylinder measurement, which will be found by miking below the ring travel. Consult following table to see if ring gaps must be filed to fit odd cylinder sizes.

SMALLEST CYLINDER MEASUREMENT	CORRECT RING SIZE
std. to .010	standard
.011 to .019	.020 oversize
.020 to .024	.020 oversize
.025 to .029	.030 oversize
.030 to .034	.030 oversize
.035 to .039	.040 oversize
.040 to .049	.040 oversize
.050 to .059	.060 oversize
.060 to .069	.060 oversize
.070 to .079	.080 oversize
.080 to .089	.080 oversize
.090 to .099	.100 oversize
.100 to .109	.100 oversize

Piston Ring Side Clearance

	RECOMMENDED		SERVICEABLE	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
TOP GROOVE	.0015	.0025	.0015	.005
2ND GROOVE	.001	.002	.001	.005
OTHER GROOVES	.001	.002	.001	.003

Piston Ring End Clearance

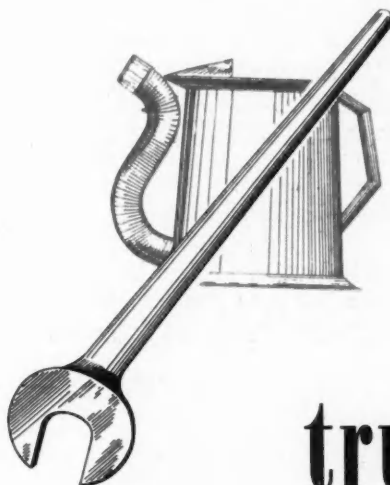
RING DIAMETER	RECOMMENDED		SERVICEABLE	
	Minimum	Maximum	Minimum	Maximum
2 2 31/32	.010	.020	.010	.030
3 3 15/32	.010	.020	.010	.040
3 1/2 3 31/32	.015	.025	.015	.045
4 4 31/32	.015	.025	.015	.050
5 5 15/32	.015	.025	.015	.055
5 1/2 5 31/32	.020	.030	.020	.055

Piston ring end clearance should always be measured at the smallest part of the cylinder bore, usually at the bottom of the cylinder below the ring travel. If ring clearance is in excess of the maximum serviceable clearance, a ring .010 in. larger in diameter should be used and the end clearance adjusted.

(TURN TO NEXT PAGE, PLEASE)

NINETEEN FORTY-NINE FLEET OPERATORS' REFERENCE ANNUAL

section 1



truck maintenance

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WEAR LIMITS

Continued from Page 65

Piston Clearance

Cam "A"—Chevrolet Six cast iron pistons must be cam ground with cam "A". Any cast iron piston in the automotive range can be cam ground with cam "A" at the option of the user. Use the following clearances when finishing either round or with cam "A":

Cyl. diam.	3	3 1/4	3 1/2	3 3/4	4
All lands	.012	.013	.014	.015	.016
Skirt	.003	.00325	.0035	.004	.0045
Cyl. diam.	4 1/4	4 1/2	4 3/4	5	
All lands	.017	.018	.019	.021	
Skirt	.00475	.00525	.00575	.00625	

Cam "B"—Ford "A" and "V8" pistons, and all pistons of the all-aluminum type having a split skirt completely open from top to bottom, use cam "B". Any Nelson wide strut or narrow strut Bohnalite piston can be cam ground with cam "B" at the option of the user. Use the following clearances when grinding round. Skirt clearance should be cut in half when using cam "B":

Cyl. diam.	3	3 1/4	3 1/2	3 3/4	4
All lands	.020	.021	.023	.025	.027
Skirt	.00225	.0025	.00275	.00325	.0035
Cyl. diam.	4 1/4	4 1/2	4 3/4	5	
All lands	.030	.033	.036	.039	
Skirt	.00375	.004	.00425	.0045	

Cam "C"—Must be used on all T-slot or U-slot flexible skirt all-aluminum pistons, having a solid section at bottom of skirt, from 2 3/4 to 3 7/16 in. diameter.

Cam "D"—Must be used on all T-slot or U-slot flexible skirt all-aluminum pistons, having a solid section at bottom of skirt, from 3 1/2 to 4 15/16 in. diameter.

Use the following clearances with both cam "C" and "D":

Cyl. diam.	3 1/4	3 1/2	3 3/4	4
All lands	.021	.023	.025	.027
Skirt	.00175	.002	.00225	.0025
Cyl. diam.	4 1/4	4 1/2	4 3/4	5
All lands	.030	.033	.036	.039
Skirt	.00275	.003	.00325	.0035

Cam "E"—Must be used on Nelson Autothermic pistons. Same shape as cam "B" but with .013 in. drop at pin which is necessary because of the solid skirt.



Piston to Cylinder Fit

If the piston skirt diameter is such that the clearance between it and the smallest diameter of the cylinder is 1 1/2 times as much as the clearance recommended by the manufacturer, the pistons should be resized. Pistons should always be resized before piston pin holes are reamed for replacement pins.

TYPE SET	MAXIMUM TAPER	MAXIMUM OUT OF ROUNDNESS
Plain	.003	.001
Expander (cast iron)	.006	.002
Expander (steel oil)	.012	.004

Cylinder Wear

Where the cylinder taper does not exceed .005 in., the so-called rering job will generally give satisfactory results with conventional compression and oil rings.

Where the cylinder taper is in excess of .005 in.—and if it does not exceed .010 in.—and it is impractical to recondition the engine, a rering job will generally give satisfactory results with spring type rings.

Any cylinder that is worn or tapered .015 in. or more should be rebored even though the rings are designed to operate in much greater tapers. Maximum out-of-roundness permissible is .005 in. If the cylinder has holes or pockets or waves which are more than .001 in. deep, or a ridge at the bottom of the ring travel area, the cylinder should be rebored.

Cylinder Finish

Recommended cylinder finish in all rebore, rering and resleeve installations is 10-25 microinches RMS. with a cross hatch pattern of scratches. In rebore and resleeve installations the use of a 200-250 grit hone stone is recommended. Hone must be allowed to cut-self free with no pressure upon removal. In a rering installation the recommended finish can be obtained by using a Deglazer with 3/0 emery cloth. Clean cylinders with brush, hot water and soap.

Piston Pin Fit

Pin fits naturally depend upon the condition of the pin hole. The more accurately a pin hole is finished the looser the pin will feel with the same clearance. The fits specified below cover an average condition. Piston pin to con-rod clearance: this should be a drop fit in full floating or set screw type pins.

	Oscillating	Full Floating	Set Screw
Cast Iron—Bushed	Thumb fit	Light	Light
Cast Iron—Not Bushed	Free Drop	Drive fit	Drive fit
High silicon	Thumb fit	Thumb fit	Light
Other aluminum	Palm fit	Light	Drive fit



MAIN & CONNECTING RODS

The following companies have provided information for this section: Federal Mogul, Monmouth Products Co., Clawson and Bals, Inc., Cleveland Graphite Bronze Co.

Bearing Tolerances

CRANKSHAFT—A shaft worn to the extent that the bearing surfaces are ridged and scored, is unfit for use and must be reground.

JOURNALS: Should not be more than .003 in. (a) out-of-round.

CRANKPINS: Should not be more than .002 in. out-of-round. If main journals or crankpins exceed these tolerances, the shaft is unfit for further use and must be reground.

CRANKCASE—Bearing Saddle Bores: Must be round within .002 in. (b) and in true alignment lengthwise for use with precision insert main bearings. Maximum out-of-round journals should not be used with maximum out-of-round case bores.

MAIN BEARINGS—Spread (width across the open ends) should exceed the crankcase bore diameter by .005 in. to .020 in., depending on the thickness and structural stiffness of the bearing.

CONNECTING RODS—Crankpin bearing bore and the piston pin bushing bore must be parallel with each other within .001 in. in 6 in., and the twist between these bores must not exceed .001 in. in 6 in.

ROD BORE: Must be round within .002 in. (c) Maximum out-of-round rods should not be used with maximum out-of-round crankpins.

ROD BEARINGS: Spread (width across the open ends) should exceed the rod bore diameter by .005 in. (d) to .020 in., depending on the thickness and structural stiffness of the bearings. The Ford V8 rod bearings are exceptions to this rule.

CAMSHAFT BEARINGS—After an engine has used up two sets of main and connecting rod bearings, the camshaft bearings are a potential source of trouble due to wear and should be checked for possible replacement.

Crankshaft End Clearances

FOR THE RODS, it is sufficient to be sure that the fillet at the ends of the crank pin does not bind on the end of the crank pin bearing. A clearance of .004 in. to .010 in. is recommended.

FOR THE CRANKSHAFT, end play or clearance is recommended as follows:

CRANKSHAFT JOURNAL DIAMETER	CRANKSHAFT END CLEARANCE
2 to 2 3/4	.004 to .006
2 13/16 to 3 1/2	.006 to .008
3 1/2 plus	.008 to .010

Bearing Oil Clearances

The general rule for the size of the oil clearance, for pressure lubricated bearings, is to allow .001 for each inch of journal diameter, subject to modification depending upon the bearing metal alloy used, i.e.:

TYPE OF BEARING	SHAFT DIAMETERS
	2" to 2 3/4" 2 13/16" to 3 1/2"
Titan Ring	
True & Tin	
Base Babbitts	.0015-.0025 .0025-.0035
Cadmium	.002-.003 .003-.004
Copper Lead	.0025-.0035 .0035-.0045

Tolerances given by Cleveland Graphite Bronze are lower, as noted:

- Journals—.002 in.
- Bearing Saddle Bore—.001 in.
- Con Rods Bore—.001 in.
- Rod Bearings—.020 in.

VALVES AND VALVE SEATS

Information provided by Thompson Products Co. and Toledo Steel Products Co.

Valve Seat Runout

Both the seat in the block or head, as well as the face of the valve itself should be checked by means of a dial indicator for runout. The valve seat should be concentric with the guide to within .0015 to .0025 total indicator reading. The valve face should be concentric with the stem to within .0025 to .003. Bent pilots and worn guides will give false readings. Replace guides not up to standard.

Valve Seat Width

Valve seat widths will vary according to design and dimensions of the valve head, type of engine and conditions of operation. The general rule is a wide seat for a hot running engine and a narrow seat for a cool running engine for long valve life.

The valve seat width further is governed by the thickness of the valve head margin which is approximately 3/64 in. wide on most valves and after refacing should be at least 75 per cent of what it was originally. The thinner the margin, the wider the face.

Valve Seat Angle

Valve seat angle should be within 1/2 deg. of that specified by the engine manufacturer. This should not be confused with the interference angle between the valve face and valve seat specified by some engine manufacturers, i.e., valve face 46 1/2 deg., valve seat 45 deg., interference of 1 1/2 deg.

Valve Stem Wear

Valve stem wear should not exceed .001 in. under the original diameter. That portion of the valve stem below the valve lock groove is not a wearing surface and consequently can be used to measure the original diameter of the stem. Valve stem warpage, .003 max. Valve stem length, ± 1/32 on tip below lock.

(TURN TO PAGE 256, PLEASE)

EATON FRONT & REAR AXLE

The axle division of Eaton Mfg. Co. has submitted valuable information on wear limits for its line. The data covering both front and rear axles will be found in the table below.

Dimensions given are a fair average of the entire line

PARTS	SPECIFIED FIT OF CLEARANCE	SERVICEABLE AFTER WEAR
Gear mesh, bevels—backlash	.008 to .015	.018
Herringbone mesh—backlash	.010	.015
Gear mesh—differential backlash	.010 max.	.015
Bearing fit—cones where free—Pinion End	.001 loose to .005 tight	Loose—.002
Bearing fit—cones where free—Housing Tube	.0002 to .0017 loose	Loose—.002
Bearing fit—cones where free—Front Axle inner wheel brg.	.0005 to .0015 loose	Loose—.002
Bearing fit—cones where free—Front Axle outer wheel brg.	.0005 to .002 loose	Loose—.003
Bearing fit—cups where free—Diff. Brgs. L.H. and R.H. Side	.005 tight to .0015 loose	.002
Differential side pinion and spider	.002 to .004 loose	.006
Side gear in differential case	.004 to .007 loose	.009
Internal gear idler pinion and pins	.0045 to .0065 loose	.009
King pin fit in I-beam	.000 to .0015 loose	.002
King pin fit in Knuckle bushings	.0005 to .002 loose	Loose—.003
Differential washers back of gear	.002 loose to .006 loose	Loose—.010



MEASURING AND ADJUSTING

With Precision

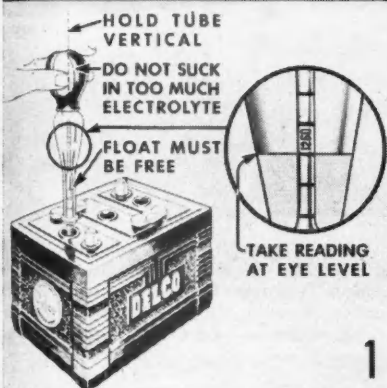
PRECISION INSTRUMENTS are only as good as the mechanic who uses them, and conversely, accurate checks depend in great part upon the use of reliable precision tools. Today the mechanic cannot rely on looks, feel or guess if the vehicle is to run long and efficiently. Modern engines are manufactured to close tolerances, and such must be maintained to withstand speeds, loads and abuse to which power plants and power trains are continually exposed.

Pictured here are proper instruments in use for each phase of vehicle service. Views show how to use the tool, where to take the measurement, how to read the dials and gages to make checks and adjustments.

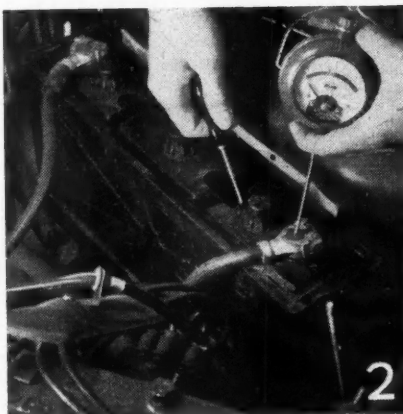
This pictorial supplement to the Service Specifications and other maintenance data throughout the issue can be used in training new mechanics, in providing older men with an up-to-date guide, in checking up on the work in your shop.

The following companies have provided photographs for this article: B. C. Ames Co., L. S. Starrett Co., Brown & Sharpe Mfg. Co., Standard Gage Co., Rinck-McIlwaine, Inc., and others.

ENGINE TUNE-UP



1



2

BATTERY 1. Hydrometer measures approximate capacity available in the cell. Take reading at eye level and only after water is thoroughly mixed with electrolyte. See that float is free and make allowance for temperature.

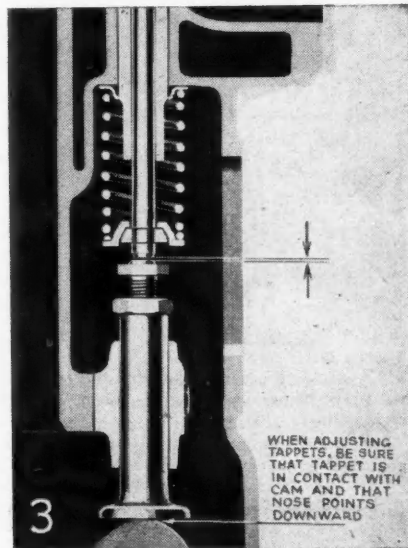
2. Check voltage drop across the cell with voltmeter, with battery under load. Check each cell separately and finally voltage drop across the terminals while starter is turning engine.

VALVES 3. Set valves at manufacturer's tappet clearance for valve timing and reset with feeler gage after engine has warmed up (when settings are given for hot engine).

4. On overhead valve engines use feeler gage between rocker arm and lifter rod. Adjust to slight drag on feeler.

SPARK PLUGS 5. Check spark plug gap with special tool. Feeler gages may not give accurate readings since flat stock may not conform to wear in electrode.

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3



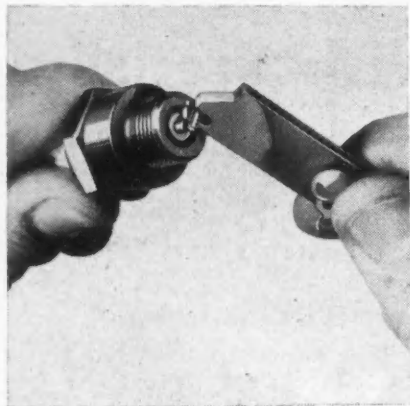
5



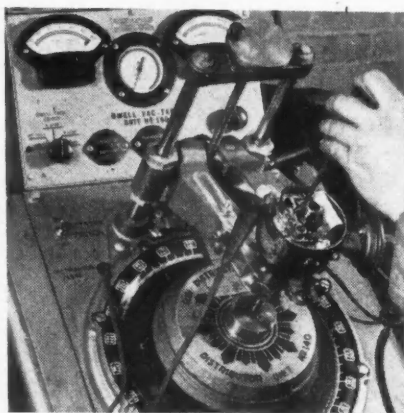
4

Measuring and Adjusting . . .

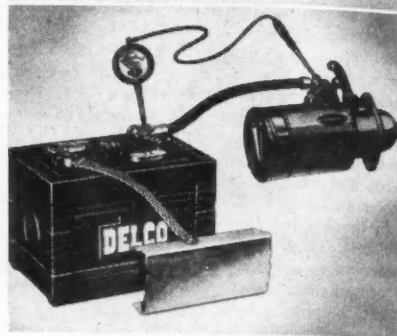
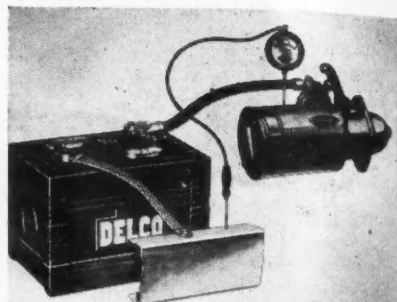
Continued from Page 67



Adjust gap by moving electrode on shell with tool designed for the purpose. Bending center electrode will break porcelain. Check manufacturer's specifications for correct gap spacing.



DISTRIBUTOR. When distributor is removed, check dwell angle, centrifugal advance, vacuum advance and point synchronization and spring tension on a distributor tester.



ELECTRICAL. Measure voltage drop between grounded battery terminal and frame, between cranking motor housing and frame, between ungrounded battery terminal and cranking motor terminal.

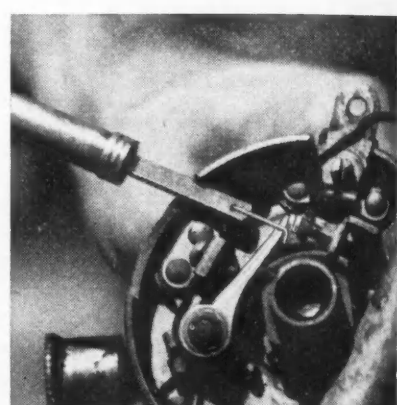


New points may be set with feeler gage to manufacturer's specifications. After tightening set screws, recheck point gap. There must be no build up on points if accurate settings are to be obtained.

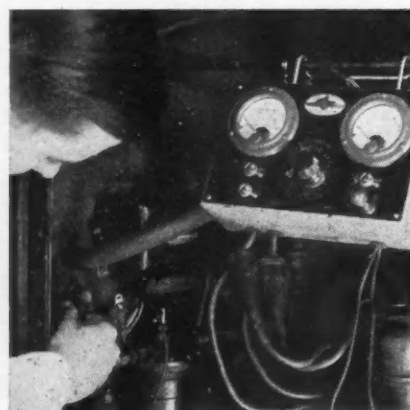


DIAL INDICATOR METHOD OF SETTING CONTACT POINT OPENING

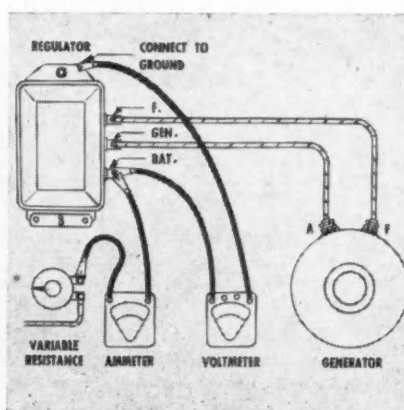
Accurate setting of contact point gap can be obtained with a dial indicator. A cam or contact angle meter may also be used without removing distributor from the vehicle.



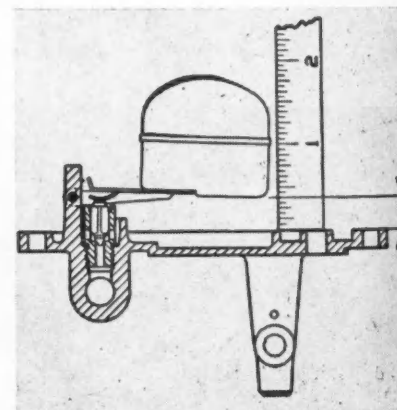
Measure contact point pressure with spring gage. Refer to specifications for correct tension. Adjust by bending breaker lever spring with pliers. Check pressure of new points after installation.



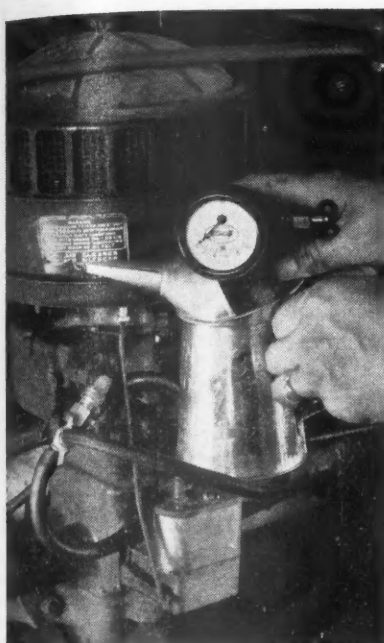
With voltmeter check charge rate of generator, voltage setting of regulator, and cut out closing amperage. Refer to manufacturer's recommendations for methods of adjusting each type and model.



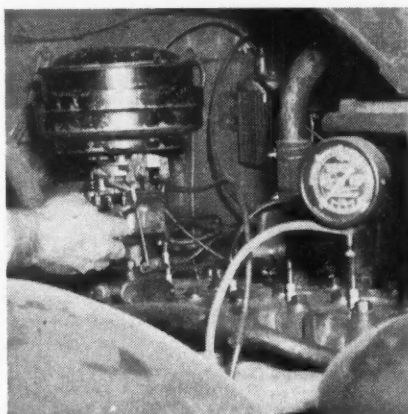
Schematic diagram showing hook up of voltmeter to check one type of regulator. Refer to vehicle manual for adjustment procedure and instrument hook up as units will vary.



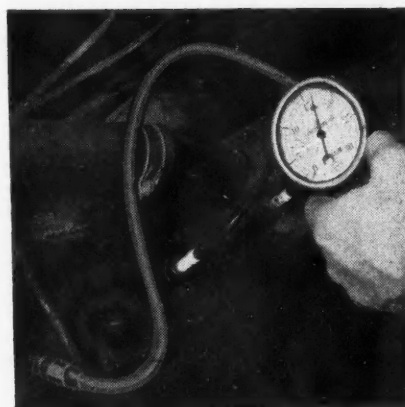
FUEL. Check float level setting of carburetor by measuring from top of carburetor body (top casting inverted) to float position with float needle on seat. Refer to manufacturer's specifications.



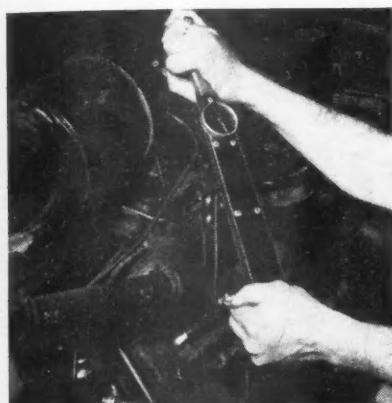
Check fuel pump capacity with line cut into fuel line through a T. Refer to tables for correct fuel volume.



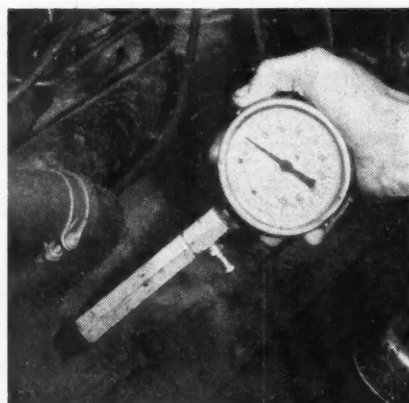
Set carburetor at engine idle (after warm up) with vacuum gage connected to windshield wiper outlet.



Check fuel pump pressure with vacuum gage attached to fuel line disconnected at pump.



TENSIONS. Check cylinder head cap screws or studs with tension wrench. Refer to tension specifications for correct readings for head bolts and bearing cap screws.

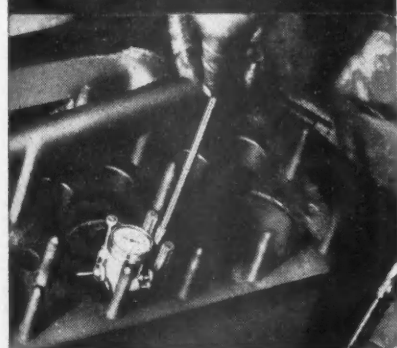


COMPRESSION. Take compression readings of each cylinder with compression gage. Warm up engine, open choke and throttle and turn engine with cranking motor for each cylinder.

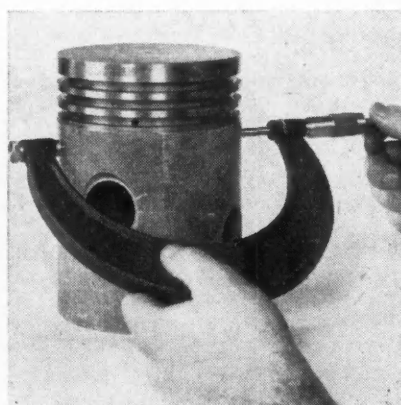


TIMING SPARK. Check spark timing with timing light. Some engines have timing marks on front harmonic balancer, while others are calibrated at flywheel. Always recheck timing on road test.

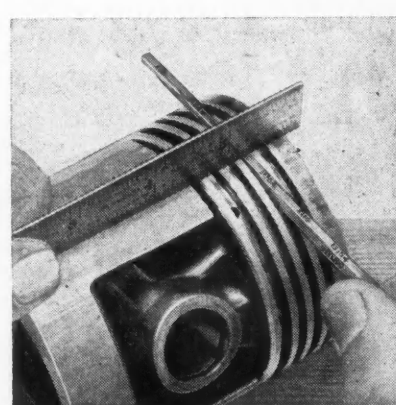
VALVE & RE-RING JOBS



CHECKING CYLINDER BORE. Set the micrometer to the original size of the bore and fit the contacts of the cylinder gage between the contacts of the micrometer. Slide the cylinder gage into the bore below ring travel.



CHECKING PISTON SKIRT. Measure piston diameter at top and at lower section of skirt to check for skirt collapse. Collapsed skirts may be reconditioned by resizing on a special tool or machine when not otherwise damaged.

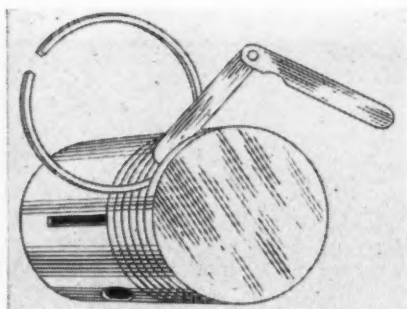


CHECKING GROOVE DEPTH. Lay a straight edge against the solid side of the piston skirt and insert a land depth gage in the groove. Measure ring thickness at the joint of the ring.

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Measuring and Adjusting . . .

Continued from Page 69



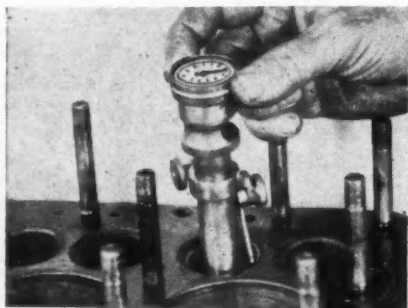
RING TO LAND CLEARANCE. Check ring fit in groove by rolling it entirely around the circumference of the piston. Insert feeler gage of recommended thickness between ring and land at several points around piston.



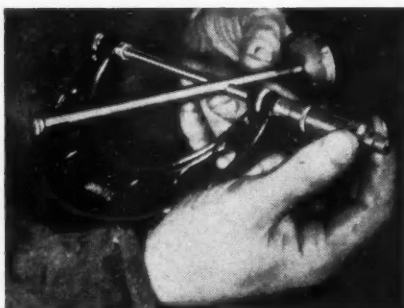
PISTON RING END GAP. Push free ring down into bore one to two inches. Check clearance at gap with feeler gage. If not within manufacturer's recommendation, grind down on proper tool and recheck. Stack rings in order.



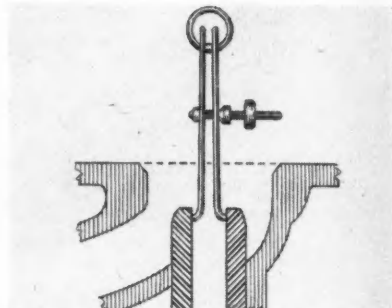
ALIGNING RODS. Bolt bearing of rod to aligning mandrel. Check to see that piston pin is parallel to mandrel face plate, that piston is parallel with face plate, that rod bore is concentric with rod itself, that rod has no twist.



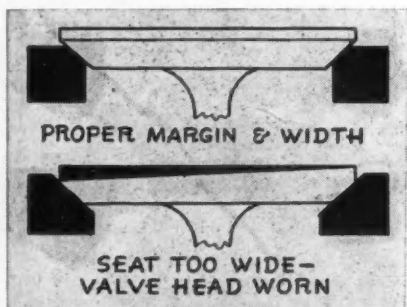
VALVE SEAT RUNOUT. Place pilot in guide and slip valve seat indicator over pilot. Adjust contact to seat with dial at zero. Turn indicator slowly around seat. Movement on dial shows amount of runout. Use seat reamer to align. Refer to Wear Limits for tolerance.



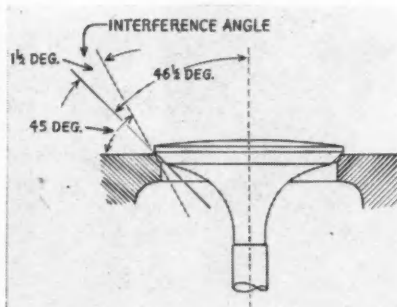
STEM-TO-GUIDE CLEARANCE. Insert inside calipers into top of guide and set. Transfer reading to rule or outside mike. Measure diameter of valve stem at spot operating in guide with micrometer. Difference between readings indicates clearance.



CHECK VALVE GUIDES—with inside calipers or use go-no-go gage. When clearance with stem exceeds original clearance by .002 in., replace either valve or guide, or both. Regrind seat to make concentric with newly installed guide. Also check guide position.



VALVE SEAT. Examine valve heads for feathering (indicating warpage of stem) and for proper width and location of seat. Make pencil marks approximately $\frac{1}{4}$ in. apart all around face of valve. Insert valve and turn on seat.

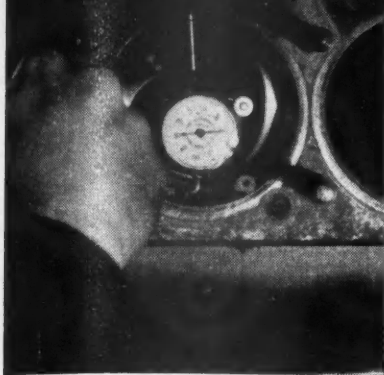


INTERFERENCE ANGLE. Some manufacturers specify an interference angle between valve face and valve seat. Measure angles as shown. Seat angle should be within $\frac{1}{2}$ deg. of that specified by manufacturer.

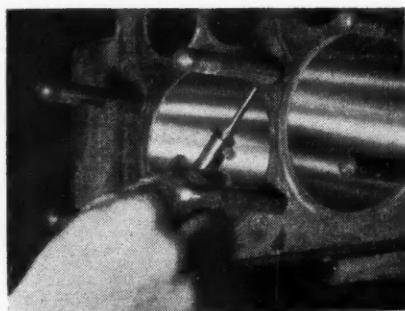


VALVE SPRING TENSION. Place spring in spring tension gage and compress to dimensions given in tables. Replace springs falling below minimum required tension. Check free length with rule or compare with new ones.

RECONDITIONING



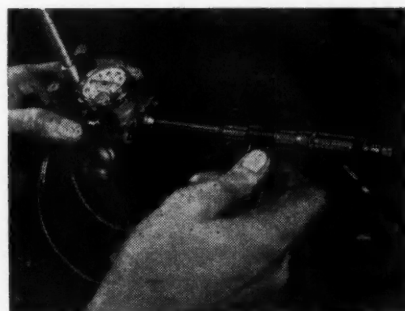
CHECK FOR CYLINDER WEAR—with cylinder gage. Set mike to original size of the bore and fit contacts of cylinder gage between contact of mike. Turn the indicator dial to zero and slide the gage into the cylinder. Slide the gage slowly from top to bottom with sled held squarely against wall. Then turn



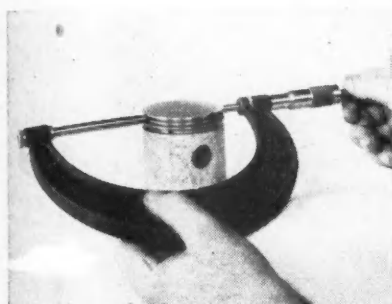
the gage around holding handle inclined toward inside of cylinder. Various readings will show amount of taper or out or round existing in cylinder.

FITTING PISTONS—with cylinder gage. Check piston diameter at top and at skirt with outside mike. Discard if

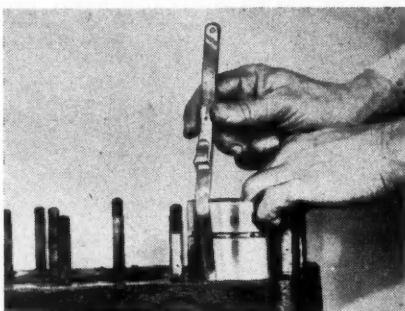
SERVICE INSTRUCTIONS



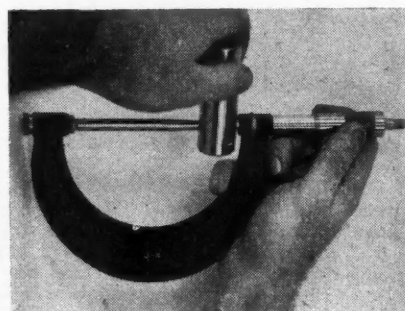
collapsed or worn beyond allowable limits. If piston is to be used again, set mike to diameter plus recommended clearance. Fit contacts of cylinder gage inside mike and turn dial of gage to zero. Then bore or grind bore to size. Check with gage after each cut to determine proper dimension.



MEASURING PISTON CLEARANCE—with micrometer. Adjust inside micrometer or a telescoping gage to inside dimension of bore. Fit should be snug but not tight. Measure setting of gage with outside micrometer. Then measure piston diameter with outside mike and subtract the readings.



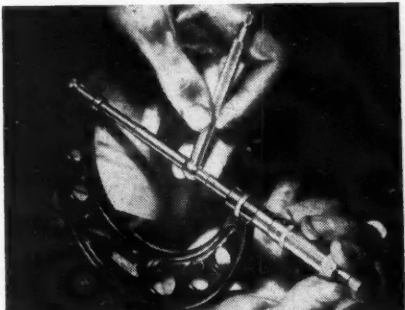
FITTING PISTONS—with feeler stock. Use piston as a gage. Insert it into the bore upside down with pin and rings removed and use feeler stock of clearance required. Bore or grind cylinder until piston and stock fit snugly into bore. See that feeler stock is in good shape and slides squarely into cylinder with piston.



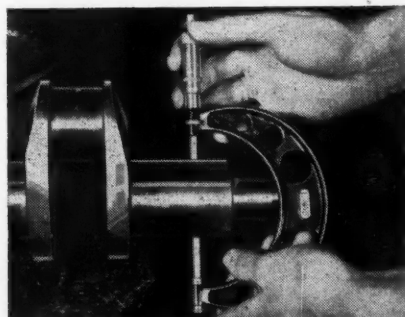
FITTING PISTON PINS—with micrometer. Ream or hone piston pin bosses or bushings to take oversize pins. Take diameter of piston pin with mike and measure reamer diameter. Ream boss until pin will start to enter bore with finger pressure. Check specifications for proper fit.



CHECKING BEARING CLEARANCE—with micrometer. Center the inside mike or telescoping gage in main bearing journal. Lock the contacts and take measurement with an outside mike. Take diameter reading of crankshaft journal at several points and subtract reading from former. This is the clearance.



FITTING MAIN BEARINGS TO CRANKSHAFT—with feeler stock. Place feeler stock of recommended thickness or within maximum clearance specified by manufacturer in lower bearing cap and coat with oil. Tighten bolts with tension wrench and tap sides of cap with soft hammer. Correct fit requires a drag



of crankshaft requiring both hands to rotate. When shim is removed, crankshaft should turn with no perceptible drag.

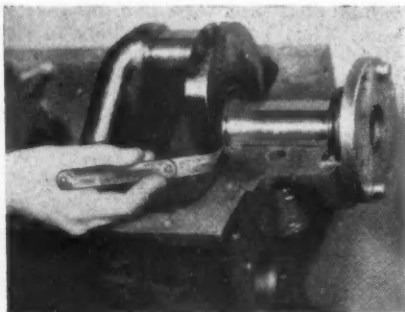
FITTING ROD BEARINGS TO SHAFT—with feeler stock. Place feeler stock of required thickness in center of

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Measuring and Adjusting . . .

Continued from Page 71

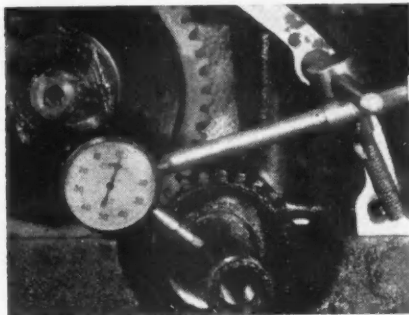
bearing cap and saturate with light engine oil. Assemble rod bearing to its respective crankpin and pull down rod bolts with torque wrench. Rotate rod on journal. Check manufacturer's recommendations for fit. However, if not available, clearance can be assumed to be correct when a drag of 5 to 10 lb is required to turn bearing on journal. Shimmed bearings may be adjusted by adding or removing shims. When feeler stock is removed, bearing should rotate freely.



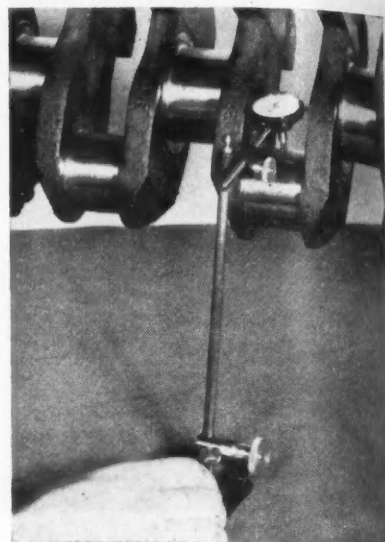
CHECKING CRANKSHAFT END PLAY—with feeler gage. If thrust is taken up at front, force shaft to rear, and with feeler gage measure clearance between thrust face of crankshaft and rear face of thrust washer. On engines where thrust is taken up at rear or intermediate rear bearing, shaft should be thrust forward as far as possible and clearance should be measured between thrust face of crankshaft and the bearing flange.



FLYWHEEL RUNOUT. Clamp dial indicator to convenient location (frame here) and adjust contact to surface of flywheel with dial set at zero. Turn flywheel and check travel of needle which will indicate any possible runout of flywheel.

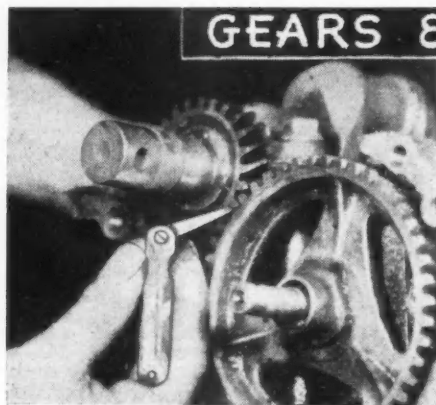


CHECKING FOR OUT-OF-ROUND JOURNALS. Mount dial indicator so that contact fits against journal to be tested—with crankshaft installed and bearing cap removed. Adjust dial to zero and rotate shaft slowly. Fluctuation indicates out-of-round journal.



CHECKING FOR CRANKSHAFT RUN OUT—with dial indicator. Place crankshaft on balancing ways or support crankshaft on V blocks. Set dial indicator at zero and mount so that contact fits against journal to be tested. Rotate shaft; fluctuation indicates run out.

GEARS & SHAFTS



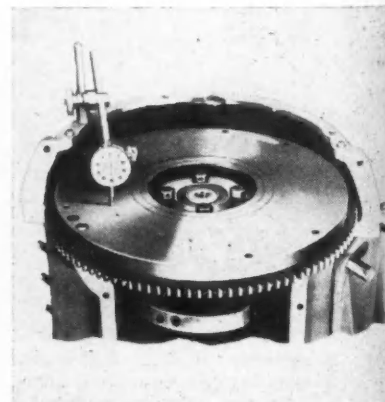
TIMING GEAR BACKLASH. Slip feeler gage between a camshaft gear tooth and a crankshaft gear tooth. Backlash should not be more than .006 on most engines. Refer to manufacturer's recommendations for maximum tolerance.



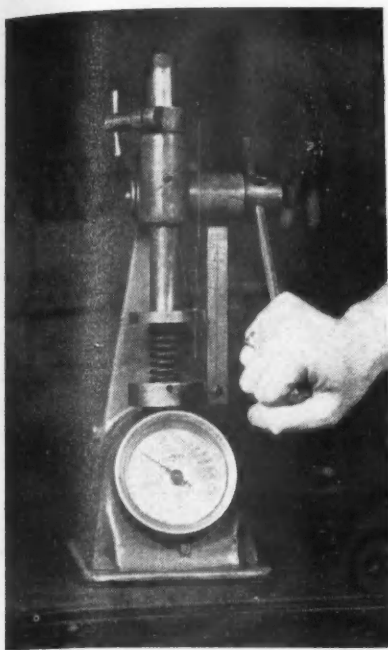
BACKLASH IN DIFFERENTIAL. With dial gage clamped securely to differential housing, adjust contact to tooth of ring gear with hand or dial at zero. Check manufacturer's specifications for safe tolerances.



ALIGNMENT. To check alignment of transmission mounting surface clamp dial indicator to clutch housing with contact

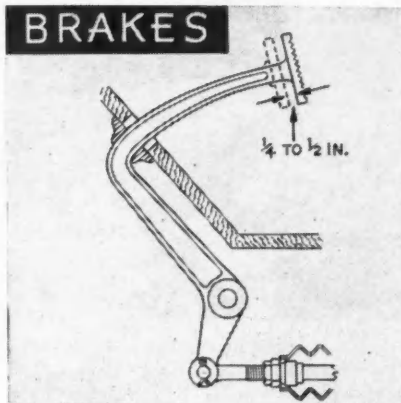


touching transmission mounting as shown. Turn flywheel and note indicator hand movement which will register run out.

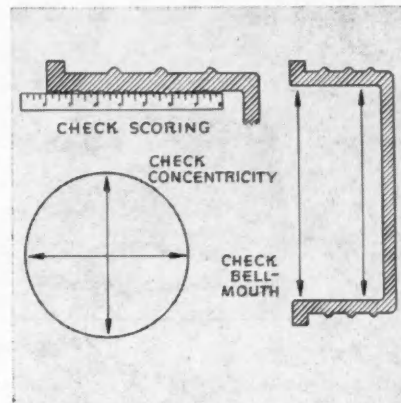


For accurate work check clutch spring pressures on a spring tester. Refer to manufacturers' specifications for proper tension. Springs must not vary in pressure for best clutch operation. Replace all springs when some are found weak.

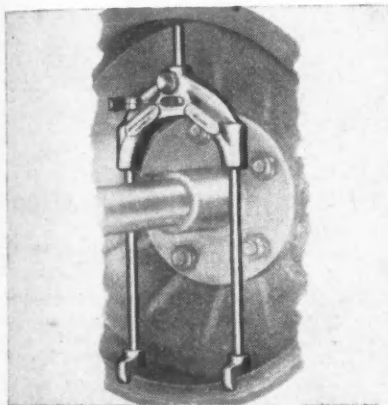
BRAKES



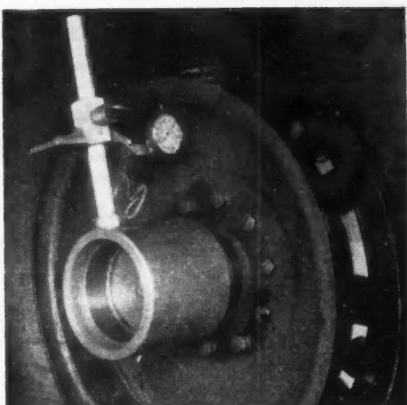
ADJUST TOE BOARD CLEARANCE—with rule. Where provision is made for pedal stop in master cylinder push rod construction, maintain $\frac{1}{2}$ to $\frac{1}{4}$ in. clearance between pedal arm and underneath side of toeboard—or measure at pedal.



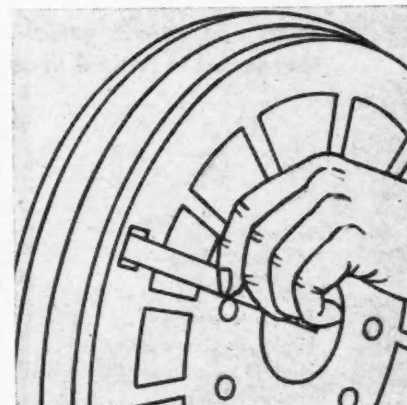
DRUM SCORING. When drums are removed, check for drum scoring with straight edge as shown. Measure drum diameter at back and at mouth to check for bell mouth conditions. Make two checks at 90 deg. as indicated.



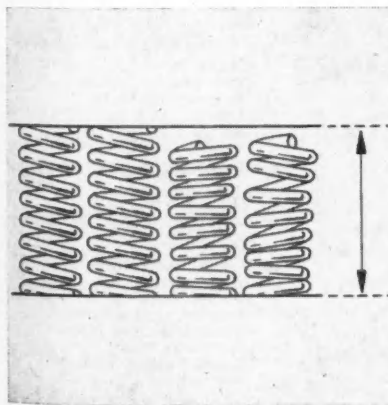
CHECK FOR BRAKE DRUM ECCENTRICITY with any of several special gages for the purpose. Refer to Wear Limits for maximum out-of-round permissible.



A dial gage with special fixture provides an accurate means of checking for runout or eccentricity of the brake drum.

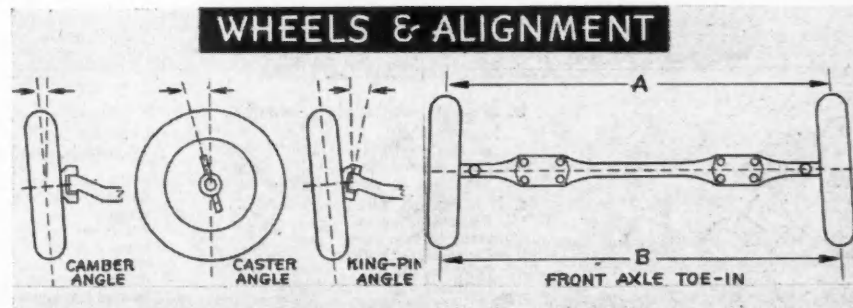


DRUM TO LINING FIT. On vehicles equipped with hole for checking drum to lining fit, use feeler gage.



CHECK CLUTCH SPRINGS. Compare removed clutch springs with new ones for free length. When coils are sprung or tension is reduced, replace all springs.

WHEELS & ALIGNMENT



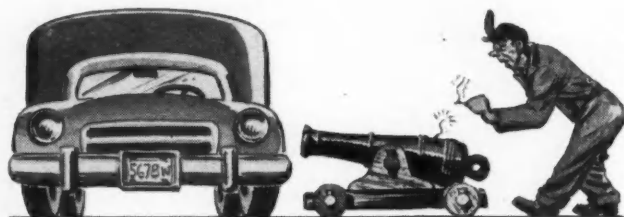
Use precision equipment for accurate inspection and correction of steering angles. **CASTER** gage measures angle in degrees between the tilt of the front axle and a perpendicular. The **CAMBER** gage measures the angle in degrees that the wheels are tilted outward at the top.

KING PIN ANGLE is the angle in degrees at which the steering knuckle or

spindle is mounted on the axle. Most gages will measure all three angles. **TOE IN** is the quality of the front wheels whereas they are turned in at the front. Toe in is measured at the tire centers or from the rim bead with wheels straight ahead. Difference between measurement A and measurement B is toe in.

(TURN TO PAGE 252, PLEASE)

TROUBLE SHOOTING *Guide*



Noise, wear, appearance or peculiar operating characteristics tip off the troubleshooter in locating breakdowns and causes of failure. This comprehensive guide will help the mechanic track down potential road breakdowns, costly part failures and unsafe vehicle conditions. Procedure is arranged in logical order for speed and efficiency.

by **M. K. SIMKINS**

Technical Editor
Commercial Car Journal

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Engine Starting

1. When starter won't function:

- a. If lights stay bright, check for—
Open circuit at starter
Stuck solenoid
Defective starter switch
Improperly seating brushes
Broken starter drive

b. If lights dim slightly, check for—
Jammed starter drive
Dirty commutator
Resistance at starter switch

- c. If lights go out, check for—
Discharged battery
Loose battery cable
Corroded terminals
Defective cell
Tight engine bearings

2. When starter turns, and engine won't start:

- a. If ammeter is dead, there is an open circuit in the primary. Check for—
Points set too wide
Corroded points
Defective ignition switch
Defective distributor drive
Loose wire at distributor (primary)
Open winding in coil
Defective ammeter

b. If ammeter shows steady discharge, there is a grounded primary. Check for—
Defective insulation, primary wires
Points set too close
Worn distributor cam lobes
Worn rubbing blocks on points
Grounded contact point arm
Shorted condenser
Shorted primary winding in coil

- c. If ammeter reading is normal, but spark does not reach plugs, check for—
Wet high tension wires
Defective distributor cap
Defective rotor brush or contact
Grounded wire, coil to distributor
Corroded wells in distributor cap
Defective coil or condenser

3. When spark is ok, but engine won't start:

- a. If there is no fuel at carburetor, check for—
Empty gas tank
Clogged fuel line
Clogged fuel filter
Restricted vent in gas tank
Defective fuel pump
Air leak in line from tank
Clogged carburetor screen

b. If there is fuel at carburetor, check for—
Flooding at carburetor
Choke not operating
Water in gasoline
Restricted carburetor jets

c. If fuel does not reach carburetor, check for—
Poor engine compression
Leaking intake manifold
Loose carburetor flange
Broken manifold heat control valve
Restricted low speed circuit
Valves out of time

d. If there is flooding at carburetor, check for—
Choke out of adjustment
Clogged air strainer
High float level
Excessive fuel pump pressure

4. When there is good spark and proper fuel supply—check for:

- Defective spark plugs
Spark plug gap set too wide
Improper spark timing
Water in cylinders
Poor fuel



Engine Operation

1. When engine misfires at idle:

a. Trouble may be in ignition.

Check for—

- Plug gaps set too wide
Defective spark plugs
Sticking breaker arm
Incorrect breaker point gap
Loose wire in primary circuit
Defective distributor rotor
Corroded, pitted breaker points
Cracked distributor cap
Leaking or wet high tension wires
Worn cam lobes on distributor shaft
Worn distributor shaft bushings
Defective coil or condenser
Defective ignition switch
Spark out of adjustment

b. Trouble may be carburetion.

Check for—

- Dirt or water in fuel
Incorrect fuel level
Leaking intake manifold
Burned heat riser tube

2. When engine misfires at high speed:

a. Check for conditions under No. 1

b. Check spark for—

- Weaker breaker arm spring
Breaker points set too wide
Defective spark advance
Wrong type spark plugs
Weak valve springs
Excessive carbon in head
Poor compression

3. When engine backfires:

a. Through exhaust, check for—

- Cracked spark plug porcelain
Crossed spark plug wires
Air leaks at manifold
Weak valve springs

- b. Through carburetor, check for—
 Poor quality fuel
 Excessive lean or too rich mixture
 Intake manifold air leaks
 Sticking distributor governor
 Improper ignition timing
 Engine preignition
 Incorrect valve timing
 Improperly seating valves

4. When there is preignition:

- a. Check for ignition causes—
 Spark set too fast
 Incorrect type spark plugs
 Burned spark plug electrodes
 Faulty distributor advance
- b. Check for fuel causes—
 Poor grade of fuel
 Lean carburetor mixture
 Inoperative heat control valve
- c. Check for overheated valves from—
 Insufficient valve tappet clearance
 Incorrect valve seat width
 Thin edged valves
 Too strong valve springs
 Incorrect type of valve
- d. Check for other causes, such as—
 Excessive engine temperature
 Carbon deposits in combustion chamber
 Sharp edges in combustion chamber
 Cylinder head projection into chamber

5. If noise is at oil pump or distributor shaft, check for:

- Oil pump loose on mountings
 Damaged or scuffed oil pump gears
 End play in distributor shaft drive
 Worn shaft bushings
 Couplings loose on shaft
 Worn oil pump and distributor driven gear
 Worn or damaged camshaft drive gear
 Improper mesh of drive and driven gears

6. If noise is in water pump, check for:

- Lack of lubrication (lubricated types)
 Worn shaft bearings
 Pulley loose on shaft
 Pump impeller loose on shaft
 Excessive end play of pump shaft
 Impeller blades rubbing pump housing
 Impeller broken or pin sheared

7. If noise is at the engine fan, check for:

- Belt adjustment too tight or too loose
 Grease or rust on pulleys
 Worn or burned fan belt
 Incorrect type or size fan belt
 Misaligned pulley
 Excessive fan shaft end play
 Fan blades loose on spider of hub
 Fan blades striking radiator
 Unbalanced fan assembly
 Uneven pitch of fan blades
 Bent, distorted fan blades

8. If noise is in fuel pump, check for:

- Fuel pump body loose on engine
 Scored lever or cam eccentric
 Interference of lever with crankcase surface
 Worn rocker arm or rocker arm spring
 Weak or worn rocker arm contact spring

4. Check for defective pistons due to:

- Normal wear
 Out of round pistons
 Collapsed piston skirt
 Insufficient drain holes in oil ring grooves
 Worn ring grooves
 Improperly fitted pistons
 Misalignment of piston and rod assemblies

5. Check for defective bearings due to:

- Scored con-rod bearings
 Worn main bearings
 Leaking main bearing seals
 Worn camshaft bearings
 Spurt holes in worn rods
 Plugged oil seal drain
 Out-of-round crankshaft
 Misaligned bearing caps
 Misaligned crankshaft

6. Check for defective valves due to:

- Valve timing too late
 Incorrect tappet clearance
 Leaky or burnt valves
 Plugged valve chamber drain
 Worn valve seats
 Worn valve stems or guides

7. Check condition of oil:

- Oil level too high
 Thin, diluted oil
 Oil pressure too high
 Broken oil lines
 Poor grade oil

8. Check for other contributing factors:

- Clogged breather
 Clogged oil filter
 Clogged muffler, tail pipe
 Leaky intake manifold gaskets
 Defective spark plugs
 Faulty carburetion
 Overheated engine
 Defective booster pump diaphragm
 Worn timing gears or chain
 Sustained high speeds
 Improper break-in of newly running engine

- Leaking float
 High float level
 Warped or bent bowl cover
 Worn metering rod
 Worn high speed circuit jets
 High fuel pump pressure

c. Too rich choke caused from—

- Plugged air strainer
 Binding butterfly valve
 Choker shaft binding
 Stuck or binding choke piston
 Leak in choke gasket
 Improper adjustment of accelerating pump

2. When trouble is in fuel pump, check for:

- Leakage around diaphragm cover
 Leaking fuel pump diaphragm
 Leaking sediment bowl gasket
 Loose valve seats
 Warped check valves
 Dirt, sediment in valves
 Corroded valve seats
 High fuel pump pressure

3. When there is fuel loss, check for:

- Leakage at lines and connections
 Leaking gas tank
 Evaporation from partially filled tank
 Evaporation from overheated lines
 Leakage at filler cap

4. When trouble is caused by ignition conditions, check for:

- Incorrect spark timing
 Leaking high tension wires
 Incorrect spark plug gap
 Fouled spark plugs
 Worn breaker points
 Faulty spark advance
 Defective condenser
 Weak ignition coil
 Pre-ignition

5. When trouble is caused by poor compression check for:

- Leaking head gasket
 Worn or broken piston rings
 Worn pistons and cylinders
 Worn valve stems or guides
 Sticking valves
 Poorly seating valves
 Weak valve springs
 Distorted head or block

6. Check for other vehicle factors such as:

- Loose carburetor flange on manifold
 Improperly adjusted or worn throttle linkage
 Restricted exhaust system
 Carbon in manifold
 Improperly adjusted manifold heat control
 Leaking windshield wiper hose
 Leaking intake manifold gasket
 Leaking manifold intake heat riser
 Overheating engine
 Unsatisfactory engine warm-up
 Use of poor grade of gasoline

7. When chassis conditions are to blame, check for:

- Dragging brakes
 Slipping clutch
 Under-inflated tires
 Excessive engine friction

8. When driving conditions are to blame, check for:

- High speeds
 Rapid acceleration
 Excessive use of low gears
 Excessive idling
 Improper engine warm up
 Use of too heavy lubricants
 Driving over hilly country
 (Turn to next page, please)



Engine Noises

1. If there is knocking at the crankshaft, check for:

- Insufficient oil supply
 Low oil pressure
 Diluted oil—water or gasoline
 Loose flywheel
 Excessive bearing clearance
 Excessive end play
 Out-of-round bearing journals
 Misaligned crankshaft
 Broken crankshaft web
 Distorted crankcase

2. If there is knocking at the con-rods, check for:

- Insufficient oil supply
 Low oil pressure
 Excessive bearing clearance
 Misaligned con-rod caps
 Misaligned con-rods
 Tapered, out-of-round journals

3. If there are piston noises, check for:

- Excessive piston to cylinder bore clearance
 Eccentric or tapered cylinders
 Insufficient piston pin clearance
 Piston hitting cylinder ridge
 Carbon in top of cylinder
 Piston hitting cylinder heat gasket
 Excessive clearance at ring groove
 Pin hole out of round with piston
 Ring lands not properly relieved

4. If there is piston pin noise, check for:

- Excessive piston pin clearance
 Insufficient piston pin clearance
 Loose piston pin lock
 Con rod end rubbing piston pin boss



High Oil Consumption

1. Check for external leakage at:

- Outside oil lines
 Front main bearing
 Rear main bearing
 Oil pan gaskets
 Crankcase ventilator pipe
 Fuel pump gaskets
 Valve cover gaskets
 Timing gear cover gasket
 Crankcase drain plug
 Oil filter gaskets
 Oil filter connections

2. Check for defective rings due to:

- Worn or broken rings
 Insufficient tension in rings
 Insufficient clearance of ring gap
 Ring fitted too tight in grooves
 Carbon in oil ring slots
 Insufficient ventilation of oil rings
 Rings out of round, warped, twisted
 Wrong size rings

3. Check for defective cylinder surface showing up in:

- Worn, wavy, distorted cylinders
 Rough finish in cylinders
 Scored cylinder walls



High Gas Consumption

1. When trouble is in carburetor—check for:

a. Flooding or leaking caused from—

- Cracked carburetor casting
 Leaking line connections
 Defective carburetor bowl gasket
 High float level
 Plugged vent hole in cover
 Loose float needle seat
 Defective needle valve seat gasket
 Worn needle valve and seat
 Foreign matter clogging needle valve
 Ridge worn in lip of float
 Worn float pin or bracket
 Float binding in bracket
 High fuel pump pressure

b. An overrich mixture caused from—

- Restricted air cleaner
 Too much oil in air cleaner
 Choke lever stuck
 Choker valve spring stuck

Troubleshooting Guide

Continued from Page 75



Electrical

1. With battery as guide:

a. If frequent charge is necessary, check for—

- Low regulator setting
- Slipping generator drive
- Corroded battery terminals
- Worn out, inefficient battery
- Short circuit in charging circuit
- Stuck cut-out in regulator
- Excessive use of electrical units
- Excessive drag in engine

b. If there is high water loss, check for—

- Too high charging rate
- Old, inefficient battery
- Leaking battery cell
- Cracked battery case
- Defective current regulation

c. If battery will not take full charge, check for—

- Low water level
- Worn out battery
- Spilled electrolyte
- Internal short circuit
- Impure electrolyte (doped up)

2. With starter as guide:

a. If there is excessive current draw, check for—

- Broken, jammed starter drive
- Dirty, gummed armature
- Shorted armature
- Grounded armature or field
- Resistance in engine parts
- Use of too heavy oil in winter
- Misaligned starting motor
- Worn armature shaft bearings
- Misaligned armature shaft
- Loose field pole pieces

b. If starter fails to operate, check for—

- Poor battery ground
- Jammed drive
- Broken teeth on flywheel
- Direct ground in switch
- Burned contact points in switch
- Improper seating brushes
- High mica between commutator segments
- Shorted armature
- Shorted field or brushes

c. If there is excessive noise at starter, check for—

- Defective starter drive
- Chipped flywheel teeth
- Insufficient lubrication
- Worn armature shaft bearings
- Misaligned starting motor
- Loose starter mounting
- Sprung armature shaft

d. If there are burned commutator bars, check for—

- Excessive arcing at brushes
- Excessive battery voltage
- Improper seating brushes
- Open circuited armature coils
- Open field circuit

3. With lights as guide:

a. If there is excessive voltage drop, check for—

- Corroded, rusty grounds
- Loose connections
- Cracked, leaking wire insulation
- Frayed, broken cable strands
- Insufficient capacity wiring

b. If lamps fail to light, check for—

- Blown fuse
- Burned out bulbs
- Loose connections
- Open circuit in wiring
- Run down battery
- Defective light switch

c. If lights flicker, check for—

- Loose connections
- Poor grounds at lamps

d. If bulbs burn out, check for—

- Excessive battery voltage
- Corroded, defective grounds
- Excessive charging rate
- Short in wiring
- Incorrect type of bulbs
- Poor grade of bulbs

4. With generator as guide:

a. If generator fails to charge, check for—

- Open charging circuit
- Cut-out points stuck open
- Sticking brushes
- Dirty, gummy commutator
- Burned out commutator
- Grounded wire in charging circuit
- Grounded field coil
- Short circuit in field
- Open coil in cut-out windings

b. If there is a low, unsteady charging rate, check for—

- Conditions listed in (a.)
- Slipping fan belt
- Loose generator pulley
- Improperly seating brushes
- Worn brushes, weak spring tension
- Incorrect type of brushes
- Out of round commutator
- Resistance in charging circuit
- High mica between commutator bars
- Grounded generator field
- Open armature winding
- Loose pole pieces in field circuit
- Defective ammeter

c. If there is an excessive charging rate, check for—

- Improperly set regulator
- Defective regulator
- Overheated battery
- Improper third brush setting
- Shorted field—internal grounded type
- Grounded field—external ground type

d. If generator is noisy, check for—

- Misaligned fan belt or pulley
- Improperly seating brushes
- Worn or damaged bearings
- Insufficient bearing lubrication
- Loose generator drive pulley
- Loose field pole pieces
- High armature slot wedges
- Excessive output

e. If there is arching and noise at brushes, check for—

- High mica between commutator bars
- High commutator bars
- Out of round commutator
- Sprung armature shaft
- Dirty, glazed commutator
- Hard spots in brushes
- Weak brush spring tension
- Brushes worn down or loose
- Loose wiring at pigtails
- Shunts loose in brushes
- Excessive output

f. If armature fails prematurely, check for—

- Excessive charging rate
- Failure of voltage regulator
- Improper type brushes
- Worn shaft bearings

5. With regulator as guide:

a. If there is excessive oxidation of points, check for—

- Reversed polarity
- Poor ground connections
- Misaligned contact points
- Improper air-gap setting
- Shorted field in generator
- Wrong type of replacement points
- Open shunt resistors

b. If there is excessive point pitting, check for—

- Long usage with normal wear
- High current output of generator
- Insufficient point spring tension
- Reverse polarity in generator
- Pitting cut-out points
- Suppression condenser on "F" terminal
- Items under 2A

c. If there are burned coil windings, check for—

- Excessive current output
- Stuck cut-out points
- Short in charging circuit
- Resistance in ground circuit

d. If there are sticking contact points, check for—

- Misaligned points
- Poor ground connection between generator and regulator
- Shorted field coil in generator
- Pitted or oxidized points
- Defective winding in regulator
- Open resistance unit

6. With ignition system as guide:

a. If there is breaker point oxidation, check for—

- High battery voltage
- Oil and crankcase vapors
- Filings lodged on points
- High resistance in condenser circuit
- Incorrect type ignition coil

b. If there is ignition coil failure, check for—

- Extremely high voltages
- Moisture formation
- Excessive heat from engine

c. If there are condenser failures, check for—

- Normal fatigue
- Excessive heat
- Moisture

d. If spark plugs burn and foul, check for—

- Incorrect type plug
- Too rich fuel mixture
- Engine pumping oil
- Inferior grade of gasoline
- Overheated engine



Compression Losses

1. Check for compression failures:

a. Engine performance shows up in—

- Loss of power
- Oil pumping—blow-by
- Smoking exhaust
- High oil consumption
- Diluted engine oil
- Poor acceleration

b. Engine sounds indicate—

- Clicking—broken ring or land
- Knocking—piston slap or broken piston
- Hissing at breather—defective intake valve
- Hissing at exhaust—defective exhaust valve
- Regular hiss—blown gasket
- Backfiring through carburetion—valve
- Backfiring on acceleration—valve failure
- Engine miss at all speeds

c. A compression gage shows—

- Low compression reading
- Low reading—two cylinders
- Leak past valves—compressed air test

d. A vacuum gage shows—

- Low vacuum gage reading
- Fluttering of needle
- Irregular drop in vacuum

2. Check piston ring conditions:

a. If rings are broken, cause may be—

- Wrong type, size ring
- Ring striking top ridge
- Worn ring grooves
- Broken ring lands
- Insufficient ring tension
- Insufficient gap clearance
- Excessive side clearance in ring groove
- Undersize pistons
- Scored, wavy cylinder walls
- Overheating

b. If there is ring sticking, check for—

- Compression blow-by
- Incomplete combustion
- Engine detonation
- Inadequate crankcase ventilation
- Improper engine cooling
- Insufficient ring land side clearance
- Dirty, contaminated oil
- Incorrect type of oil
- Poor grade of oil or fuel
- Lugging engine
- Excessive engine idle

c. If rings are noisy, check for—

- Broken piston ring
- Worn ring grooves
- Broken ring lands
- Lack of inner ring tension
- Top ring striking cylinder ridge
- Undersize pistons
- Wavy cylinder walls

3. Check for piston failures:

a. If there are piston noises, check for—

- Carbon accumulations in head
- Broken piston, skirt, ring land
- Insufficient clearance at top ring land
- Collapsed piston skirt
- Eccentric or tapered cylinders
- Excessive piston to bore clearance

b. If there is piston breakage, check for—

- Inadequate lubrication
- Overspeeding and overloading
- Pre-ignition
- Engine overheating
- Misaligned connecting rods
- Undersize pistons
- Eccentric or tapered cylinders
- Warped cylinder barrels

4. Check for cylinder failures:

a. If there is excessive wear, scoring, check for—

- Inadequate lubrication
- Contaminated or poor oil
- Incomplete combustion
- Too harsh type rings
- Improper cylinder finish
- Sharp edge left on piston skirt
- Insufficient ring gap clearance
- Tight piston pins
- Misaligned connecting rods, pins
- Distorted block, crankshaft
- Cylinders bored out of line

b. If there is cylinder warpage, check for—

- Engine overheating
- Improper head tightening
- Steam pockets in block
- Derosits between dry sleeve and bore
- Improper sleeve installation

5. Check on valve seating for:

- Insufficient valve-tappet clearance
- Broken, weak valve springs
- Improper valve timing
- Deposits under head and stem
- Warped heads and stems
- Cracked valves and seats
- Burned valves and seats
- Warped or binding guides
- Improper grinding operations
- Worn timing gears or chain



Bearings

1. Check for premature wear:

Caused by dirt from—
Careless service methods
Contaminated oil
Infrequent oil changes
Dirty oil filters
Dusty operation

2. Caused by improper fitting due to:

Distorted con-rods
Mixing con-rod caps
Installing shells backwards
Filing shell to fit
Chiseling shell to reduce clearance
Dirt between brg. and rod bore
Out-of-round journals
Tapered journals
Warped crankshaft or block
Excessive crankshaft end play
Scored bearing surface
Improper clearance
Use of inaccurate tools
Improper tensions of studs

3. Caused by corrosion from:

Crankcase acid vapors
Infrequent oil changes
Poor crankcase ventilation
Incomplete combustion
Engine blow-by
Inferior type of oil
Overcooling
Overheating

4. Caused by improper vehicle operation such as:

Oversteering
Overloading
Lugging on hills
Spark detonation
Improper engine break-in
Racing a cold engine
Use of wrong type, grade oil
Use of improper fuel
Improper spark timing

5. Caused by lubrication failures resulting from:

Defective oil pump
Clogged oil pump screen
Excessive engine sludge
Excessive engine temperature
Use of too heavy oil in winter
Insufficient engine warm up
Insufficient quantity of oil
Crankcase dilution
Inadequate crankcase ventilation



Engine Valves

1. When valves break, check for:

Excessive tappet clearance
Cocked springs or retainers
Weak valve springs
Too much spring pressure
Excessive temperatures
Excessive engine speeds
Out of round seats
Worn valve guides
Worn retainers
Worn retainer grooves
Block distortion
Defective valve forgings

2. When valves burn, check for:

Close tappet clearance
Lean air-fuel mixture
Improper block cooling
Improper spark plug heat range
Pre-ignition
Improper spark timing
Weak valve springs
Gum formations on stem
Deposits on valve seats
Excessive detonation
Exhaust back pressure
Improper valve-guide clearance
Warped valves or guides
Incorrect valve seat width
Inferior fuel
Eccentric valve face
Defective valve material

3. When there are valve deposits check for:

Inferior fuel
Inferior oil
Improper cooling
Rich carburetor setting
Dirty oil filters
Dirty air filters
Excessive oil pressure
Poor lubrication of stem
Worn valve stem
Bell-mouthed valve guides
Too much engine idling
Worn rings, cylinders, pistons

4. When valve springs break, check for:

Normal fatigue
Valve flutter at high speed
Corrosion of valve springs
Improper crankcase ventilation
Worn camshaft bearings
Worn crankshaft or bearings
Worn timing gears or chains
Worn lobes on camshaft

5. When valves are noisy, check for:

Excessive tappet clearance
Inadequate lubrication of rocker arms
Wear in tappets, adjusting screw
Wear in cam lobes
Wear in push rods
Wear in rocker arm assembly
Wear in valve guides

6. When precision adjustments are impossible, check for:

Wear in valve stem tip
Wear in adjusting tappet screw
Wear in push rod ends
Loose rocker arm assemblies
Worn rocker arms
Wear in tappet body
Wear in spring retainer slot
Wear in spring retainer cup



Hydraulic Brakes

1. Check from driver's seat for:

- Spongy pedal, a result of:**
 - Air in fluid
 - Improper brake adjustment
 - Improper brake fluid
- Rubbery pedal, a result of:**
 - Improper brake adjustment
 - Improper lining-drum contact
 - Lining of incorrect thickness
- No pedal reserve, a result of:**
 - Normal wear of linings
 - Low hydraulic brake fluid
 - Defective master cylinder
- Loss of pressure, a result of:**
 - External leak in lines
 - Leak in master cylinder check valve
 - Leak in cup of master cylinder
 - Leak in wheel cylinder, internal
 - Leak at stop light switch

e. Hard pedal, no free travel, a result of:

Swollen rubber cylinder cups
Restriction in bypass port of master cylinder
Improper lining

f. Pumping of pedal necessary, a result of:

Worn linings
Improper brake adjustment
Worn wheel cylinders or cups

g. Binding pedal, a result of:

Broken piston stop wire in master cylinder
Worn, tight, rusted linkage
Loose master cylinder mountings

h. Pedal striking toeboard, a result of:

Pedal stop ring out of seat in master cylinder
Misalignment of brake pedal
Misalignment of toeboard

i. Pedal failing to return, a result of:

Restricted bypass in master cylinder
Weak pedal return spring
Loose mountings of booster, pedal, master cylinder

j. No booster help, a result of:

Leak in vacuum lines
Loose connections
Worn valves in booster unit
Leak in diaphragm of booster unit
Linkage out of adjustment

2. Check on a road test for:

a. Poor brakes, no pedal reserve, a result of:

Improper drum-lining contact
Glazed linings
Oil-soaked linings
Improper pedal adjustment
Improper linings

b. Grabbing brakes, a result of:

Improper shoe adjustment
Grease soaked linings
Charred linings
Scored drums
Improper coefficient linings
Loose dust shields

c. Side pull, a result of:

Improper shoe adjustment
Excessive wear in drum
Scored drums
Grease-soaked lining
Loose anchor pins
Clogged or crimped wheel line
Loose dust shield
Different makes of lining
Improper shoe assembly
Water, mud in brakes
Front spring U-bolts loose
Tires not properly inflated
Weak chassis springs

d. Squealing brakes, a result of:

Dirt in brake drum
Foreign material embedded in lining
Loose lining rivets
Bent backing plate
Sprung shoes
Shoes scraping on backing plates
Distorted brake drum
Incorrect lining

e. Overheating brakes, a result of:

Improper adjustment
Dirt and grime on drums
High spots on drum
Tight wheel bearings

f. Fading brakes, a result of:

Poor lining to drum contact
Improper lining

3. Check from the lift when:

a. One wheel drags, a result of:

Improper brake adjustment
Shoes improperly installed
Distorted cylinder cups
Brake shoe seized to anchor pin
Weak brake shoe return spring
Sprung shoes
Obstruction in line
Loose wheel bearing

b. Wheel locks, a result of:

Loose lining
Loose wheel bearing
Loose anchor bolts
Out-of-round drum
High spots on lining
Loose wheel bearing

c. All wheels drag, a result of:

Improper adjustment
No free pedal travel
Swollen cylinder cups
Restricted port in master cylinder
Improper assembly of shoes
Lining of incorrect thickness



Air Brakes

1. Check air pressure system for:

a. Slow pressure build-up, resulting from—

Too slow engine idle speed
Slipping compressor drive
Clogged compressor air strainer
Leaking lines or connections
Leaking discharge valves or seats
Carbon in discharge line
Excessive carbon in head
Insufficient unloader valve clearance
Worn piston rings in compressor
Scored cylinder walls in compressor

b. Quick loss of pressure, resulting from—

Leaking lines or connections
Leaking brake valves
Sticking discharge valves
Leaking governor valve

c. Compressor not unloading, resulting from—

Defective governor
Governor out of adjustment
Stuck unloading mechanism
Excessive clearance, unloader valves
Restriction in unloading line
Carbon in unloader cavity

d. Noisy compressor, resulting from—

Loose drive pulley
Worn, burned out bearings
Worn connecting rods
Loose piston pins
Broken piston rings
Broken discharge valves
Weak, broken valve springs
Carbon under discharge valves
Carbon deposits in head
Restricted oil line to bearings

e. Oil and water in system, resulting from—

Failure to drain tanks daily
Clogged air strainer
Worn rings in compressor
Scored cylinder walls
Excessive oil pressure
Excessive temperature changes

(TURN TO NEXT PAGE, PLEASE)

Troubleshooting Guide

Continued from Page 77

2. Check foundation system for:

- a. Insufficient braking, resulting from—
 - Inadequate air pressure
 - Grease-soaked linings
 - Brake valve out of adjustment
 - Improper brake shoe adjustment
 - Lining of improper diameter
 - Glazed, worn out liners
 - Drums turned too thin
 - Push rods out of adjustment
 - Cams out of adjustment
 - Leaking brake chamber diaphragm
- b. Slow brake application, resulting from—
 - Low air pressure
 - Improper brake shoe adjustment
 - Restricted lines and tubing
 - Excessive push rod travel
 - Leaking brake valve diaphragm
 - Frozen cams
 - Moisture frozen in system
- c. Slow release of brakes, resulting from—
 - Improper brake adjustment
 - Frozen cams
 - Dry cam faces
 - Frozen anchor pins
 - Rusted cam lobes
 - Weak retractor springs

3. Check on road test for:

- a. Grabbing brakes, resulting from—
 - Grease-soaked linings
 - Loose brake liners
 - Binding brake rigging
 - Loose backing plate
 - Defective brake valve
 - Out-of-round drums
 - Drums turned too thin
 - Loose, broken spider brake
 - Broken support plate
 - Flat spots on cam
- b. Side pull, resulting from—
 - Improper brake adjustment
 - Defective lining
 - Oil soaked lining—one wheel
 - Improperly adjusted push rod travel
 - Broken shoe retractor spring
 - Leaking diaphragm in brake chamber
 - Unequal spring tension in diaphragm
- c. Noisy brake application, resulting from—
 - Loose liners or rivets
 - Foreign particles imbedded in drums
 - Poor lining contact with drum
 - Loose backing plates
 - Tool marks in drum
 - Unbalanced brake linings
 - Thin brake drums
 - Glazed, thin linings
 - Weak, broken retractor springs
 - Broken, misaligned shoes



Cooling System

1. When there is external leakage, check for:

- Loose, defective hose clamps
- Defective rubber hose
- Broken radiator seams
- Corrosion perforation of water tubes
- Loose core hole plugs
- Worn water pump shaft, seal, bearing

Damaged gaskets, pump, cylinder
Warped cylinder head or block
Cracked cylinder head or block

2. When there is internal leakage, check for:

- Loose cylinder head bolts
- Damaged cylinder head gasket
- Warped cylinder head or block
- Cracked cylinder wall
- Porosity of cylinder head (aluminum)
- Deteriorated wet cylinder sleeve seals
- Broken joints in oil coolers

3. When there is loss from overflow, check for:

- Defective pressure valve in cap
- Leakage of overflow tank
- Defective radiator baffle plate
- Air leak on suction side of pump
- Air entrainment from top tank turbulence
- Restricted passages in radiator
- Steam formation at hot spots
- Foaming of cooling liquid
- Exhaust gas leakage into system

4. When there is restricted circulation, check for:

- Slipping fan belt
- Low or too high coolant level
- Clogged radiator core
- Collapsed radiator hose
- Stuck thermostat
- Pump impeller loose on shaft
- Pump blades broken or worn
- Clogged water jacket passages
- Distribution tube dislocated
- Air leak in suction side of system
- Inadequate cooling system capacity

5. When engine overheats, check for:

- a. Cooling system factors caused by:
 - Causes listed in No. 4
 - Clogged bug screen
 - Coated radiator core fins
 - Radiator air baffles out of place
 - Bent fan blades
 - Oil and sludge in system
- b. Spark conditions caused by:
 - Incorrect ignition timing
 - Improper fuel mixture
 - Low oil level
 - Defective spark advance mechanism
 - Incorrect valve timing
 - Pre-ignition
 - Clogged exhaust or muffler
 - Defective heat control valve
 - Tight engine, bearings, pistons, rods
- c. Operating factors caused by:
 - Dragging brakes
 - Overloading of vehicle
 - Lugging engine on grades
 - Excessive engine idling
 - High sustained speeds
 - Driving in sand, snow, mud
 - Stop and go driving

6. When there is overcooling, check for:

- Defective thermostat
- Thermostat installed incorrectly
- Automatic shutters not functioning
- Defective heat control valve
- Inaccurate temperature indicator
- Excessive engine idling

7. When there is corrosion present, check for:

- Impurities in water
- Lack of rust inhibitor
- Improper draining and service
- Air leaks in system
- Electrolytic action
- High temperature

Transmission

1. When there is noise in neutral, check for:

- Insufficient lubrication
- Incorrect grade of lubricant
- Misalignment of transmission
- Sprung or worn countershaft
- Excessive end play in countershaft, reverse idler, pinion
- Worn mainshaft pilot bearing
- Scuffed gear tooth contact surface
- Excessive backlash in constant mesh gear
- Unmatched constant mesh gears
- Worn, rough reverse idler gear
- Eccentric countershaft gear assembly
- Defective second speed mainshaft gear bushing
- Worn, scored countershaft bearings
- Scuffed gear tooth contact surfaces
- Worn transmission pinion bearing

2. When there is noise in gear, check for:

- Conditions under No. 1
- Noisy speedometer gears
- Worn, rough mainshaft rear bearing
- Excessive second speed mainshaft end play
- Sliding gear teeth rough, chipped, tapered

3. When noise is due to other conditions, check for:

- Out-of-balance fan
- Loose engine mountings
- Loose transmission mounting
- Unbalanced clutch assembly
- Out-of-balance flywheel
- Out-of-balance crankshaft
- Defective torsional damper
- Worn universal joints
- U-joints improperly installed
- Misaligned, sprung driveshaft

4. When shifting is difficult, check for:

- Improperly operating clutch
- Improper adjustment of shifting linkage
- Worn shifter rails
- Worn, sprung shifter fork
- Misaligned mainshaft
- Burred mainshaft splines
- Insufficient chamfer of sliding gear teeth
- Sliding gear tight on shaft splines
- Damaged synchronizing unit

5. When gears can't be shifted, check for:

- Improperly operating clutch
- Improper linkage adjustment
- Misaligned mainshaft
- Insufficient chamfer on detent ball notches
- Sliding gear tight on mainshaft splines

6. When transmission slips out of high gear, check for:

- Improper linkage adjustment
- Misaligned transmission
- Insufficient on detent balls
- Too much chamfer on detent ball notches
- Worn clutch sleeve gear teeth
- Worn pinion gear teeth

7. When transmission slips out of second gear, check for:

- Improper linkage adjustment
- Weak detent ball springs
- Excessive chamfer on detent ball notch
- Excessive end play of second gear on mainshaft
- Worn second speed clutch gear teeth
- Excessive clearance between second speed gear and mainshaft

8. When transmission slips out of first gear, check for:

- Improper linkage adjustment
- Worn shift lever lock ball notch

Too much chamfer on detent ball notch
Insufficient gear mesh
Excessive end play of reverse idler
Worn countershaft first speed gear
First and reverse sliding gear loose on mainshaft splines
Sliding gear teeth worn or tapered
Worn, misaligned mainshaft splines

9. When there is loss of lubricant, check for:

- Lubricant level too high
- Stopped up transmission breather
- Damaged or improperly installed gaskets
- Damaged or defective oil seals
- Defective oil throw rings
- Loose drain plug, transmission cover
- Worn mainshaft bearings
- Cracked transmission housing
- Use of foaming lubricant

10. When transmission bearings fail prematurely, check for:

- Use of wrong type, grade of lubricant
- Lack of cleanliness in overhaul
- Securing too tight or too loose bearing adjustments
- Improper assembly of the unit
- Improper shifting of gears
- Excessive overloading of vehicle
- Lugging of engine



Clutch

1. Check for clutch chattering resulting from:

- Improper clutch adjustment
- Oil or grease on facings
- Glazed friction facings
- Loose facings on driver plate
- Uneven spring pressures
- Damaged drive or driven plates
- Bent clutch shaft or clutch plate
- Binding pressure levers or release levers
- Binding drive plate hub
- Worn splines in transmission shaft
- Loose universal joint flange
- Improper alignment of transmission

2. Check for clutch grabbing resulting from:

- Improper clutch adjustment
- Oil or grease on facings
- Loose engine mounts
- Worn friction facings
- Uneven spring pressures
- Pressure plate binding on studs or pins
- Binding release levers
- Improper alignment of transmission with clutch

3. Check for clutch slippings resulting from:

- Improper clutch adjustment
- Oil or grease on facings
- Binding clutch pedal
- Insufficient free pedal travel
- Warped clutch plates
- Binding pressure or release levers
- Worn friction facings
- Weak, broken clutch pressure springs
- Binding of driving pins in pressure plate holes
- Improper alignment of clutch, engine, transmission
- Driver riding clutch pedal

4. Check for clutch dragging caused by:

- Improper clutch adjustment
- Oil or grease in clutch
- Improper pedal adjustment
- Improper alignment
- Dust or dirt in clutch

Worn, misaligned clutch facings
Clutch plate hub binding on shaft
Binding pilot bearing or bushing
Sticking release sleeve
Warped, damaged pressure plate

5. Check for clutch rattling caused by:

Improper alignment
Bent clutch shaft
Worn, dry clutch release sleeve
Unequal contact of pressure levers
Dry or worn pilot bearing or bushing
Worn release bearing
Worn parts in release assembly
Damaged clutch plate
Weak or broken release lever
Anti-rattle springs
Worn splines on clutch shaft or in plate hub
Worn driving pins in pressure plate
Excessive backlash in transmission or prop shaft
Worn transmission main drive gear bearing

6. Check for clutch squealing caused by:

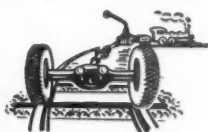
Dry clutch pilot bushing
Lack of lubrication in release sleeve
Misalignment of clutch with engine
Bushings turning in crankshaft
Worn transmission main drive gear bearing

7. Check for clutch knocking caused by:

Play between pressure plate lugs and their guides
Worn release lever guide pins
Release levers striking clutch plate
Incorrectly installed metal baffle plate
End play in crankshaft

8. Check for clutch vibrating caused by:

Improper clutch assembly alignment
Bent clutch shaft
Improper fitting of pressure plate
Loose floating type clutch release sleeve
Pressure spring off center
Flywheel out of balance
Loose flywheel
Defective vibration dampener
Loose engine mountings
Worn universal joints
Worn transmission rear bearing
Loose emergency brake drum
Loose pinion bearing in rear end



Power Train

1. Check propeller shaft for:

a. Excessive vibration resulting from—

Improper alignment of flanges
Misaligned, sprung drive shaft
Worn needle bearings in cross
Worn splines on shaft or yoke
Loose U-joint flange nut
Improperly installed key on pinion
Too short propeller shaft
Worn torque tube bushing
Missing bolt in flange
Worn rear transmission bearing
Misaligned rear wheels
Shifted rear axle
Sprung frame

b. Excessive wear resulting from—

Improper lubrication
Too short shaft
Excessive and thrust
Overloading the vehicle
Careless braking

2. Check universal joints for:

a. Out of balance resulting from—

Excessive wear
Loose flange nut
Worn keyways
Incorrect key installation
Grease fitting interference

b. Breakage resulting from—

Overloading
Misaligned drive shaft
Misaligned rear axle
High angle drive
Weak rear springs
Erratic driving and braking

3. Check differential for:

a. Case breakage caused from—

Loose case bolts
Improper adjustment differential support bearings
Excessive ring gear and thrust block clearance
Erratic clutch operation
Vehicle overloading

b. Scoring of pinions, caused from—

Insufficient lubrication
Improper grade of lubricant
Excessive loads
Excessive spinning of one wheel

c. Tooth breakage, caused from—

Normal fatigue
Erratic clutch operation
Overloading
Ice-spotted pavements

d. Side gear broken at hub caused from—

Misaligned axle shaft
Worn thrust washers
Excessive axle housing deflection

e. Noisy operation caused from—

Insufficient lubricant
Unmatched ring gear and pinion
Worn teeth in ring gear or pinion
Improper ring gear and pinion adjustment
Loose differential side gear bearings
Misaligned, sprung ring gear
Loose differential housing bolts
Loose pinion bearings

f. Loss of lubricant caused from—

Lubricant level too high
Damaged bearing grease retainer
Defective rear wheel bearing gasket
Worn axle shaft grease retainers
Defective pinion oil seal
Restricted lubricant return passage
Scored, warped companion flange hub
Cracked rear axle housing
Too high wedges at spring seat

g. Overheating of unit, caused from—

Lubricant level too high
Use of incorrect grade of lubricant
Bearings adjusted too tightly
Misalignment of bearings
Insufficient ring gear to pinion gear clearance

4. Check rear axle for:

a. Axle breakage resulting from—

Normal fatigue
Grabbing clutch
Use of emergency brake to stop
Excessive speeds, rough roads
Misaligned axle shaft housing
Vehicle overloading
Improperly adjusted wheel bearings

b. Noisy operation, resulting from—

Bent, sprung axle shaft
Misaligned axle shaft housing
Wear in axle shaft housing sleeve
End play in pinion shaft bearings
Excessive gear lash
Improper adjustment pinion shaft bearings
Loose pinion companion flange
Scuffed gear tooth surfaces
Improper bearing adjustment

5. Check rear wheels for noise due to:

Wheel loose on axle shaft taper
Worn wheel or axle shaft keyways
Wheel hub or drum studs loose
Axle shaft rubbing wheel bearing retainer
Insufficient bearing lubrication
Scored wheel bearing cup or cone
Defective, brinelled wheel bearings
Excessive axle shaft end play



Steering

1. Check for hard steering conditions caused by:

Insufficient lubrication
Underinflation
Tight steering assembly
Worn steering gear
Too much caster
Excessive, positive or negative camber
Bent, worn king pin
Sprung spindle
Sagging, broken spring
Broken frame

2. Check for loose steering conditions caused by:

Worn steering linkage
Weak springs in drag link
Worn sector shaft bushing
Worn tie rod ends
Improper steering adjustment
Worn king pins, bushings

3. Check for wander or weave caused by:

Unequal tire pressure
Sagging, broken springs
Loose spring shackles
Worn front wheel bearings
Tight steering assembly
Worn king pins, bushings
Incorrect toe-in adjustment
Insufficient caster
Loose U-bolts
Bent, broken frame
Overloading

4. Check for low speed shimmy caused by:

Too much caster
Loose king pins
Loose drag link arm
Loose steering gear
Misaligned drag link
Worn tie rod ends
Loose wheel bearings
Sagging, broken springs

5. Check for high speed shimmy caused by:

Underinflation—front tires
Unequal inflation
Loose engine mounting
Worn rear wheel bearings
Worn universal joint
Whipping propeller shaft
Wheel or tire wobble
Out-of-balance wheels
Eccentric tires
Broken, sagging springs
Worn shock absorbers

6. Check for road shock caused by:

Unequal caster
Excessive caster
Sprung front axle
Bent steering arm
Bent drag link
Weak springs
Improper tire size
Defective shock absorbers

7. Check for side pull caused by:

Unequal caster
Tight king pins
Unmatched tires
Uneven inflation
One weak rear spring
Sagging front springs
Bent steering knuckle
Bent, broken frame
Uneven braking



Tire Wear

1. Check tire factors causing premature tire wear:

Underinflation
Overinflation
"Bleeding" hot tires
Undersize tires for load
Neglected cuts and bruises
Duals mismatched for size
Duals—improper spacing
Duals mismatched for type of cord
Improper matching of inflation pressure in duals
Wrong type tire for job

2. Check vehicle factors causing premature tire wear:

Overloading
Improper loading
Excess overhang loads
Wheel misalignment
Wheels out of balance
Grabbing brakes
Unequalized brakes
Sprung or sagging axles
Sprung frame
Worn wheel bearings
Loose "U" bolts
Worn or loose wheel bearings
Bent rims
Broken springs
Improper placement of tandem axles

3. Check driving habits causing premature tire wear:

Quick starts and stops
Curb scraping and bumping
Excessive speed
"Squealing" tires on curves
Running over rocks
Parking on oily floors
Riding edge of pavement with soft, low shoulders
Improper brake application
"Spinning" tires in mud, slush

4. Check road conditions causing premature tire wear:

Abrasive road surfaces
Rutted roads
Highly crowned roads

5. Check other factors causing premature tire wear:

Atmospheric conditions
Storing tires exposed to sun
Storing tires exposed to oil
Failure to switch tires
Wrong size flap used
Loose tire chains
Foreign objects between duals



FIG. 1. Air and water gun application is typified by this Trivit washer

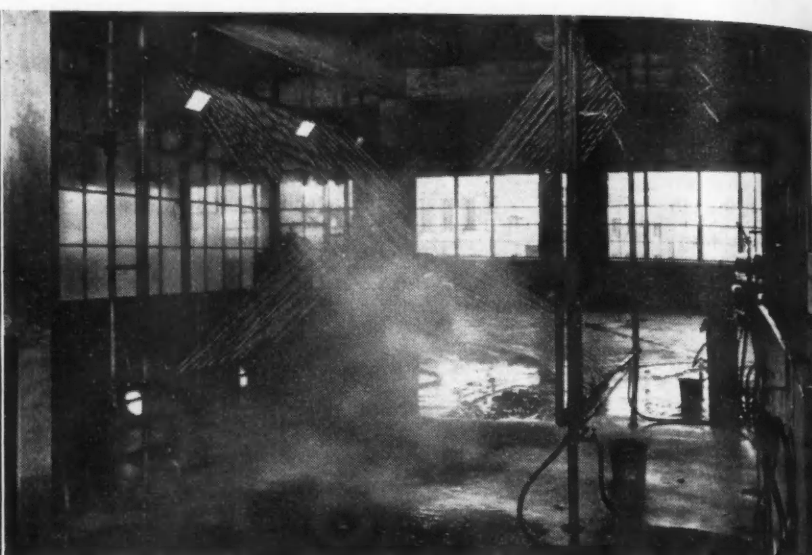


FIG. 2. The two-pipe tunnel has separate lines for water and soap solution

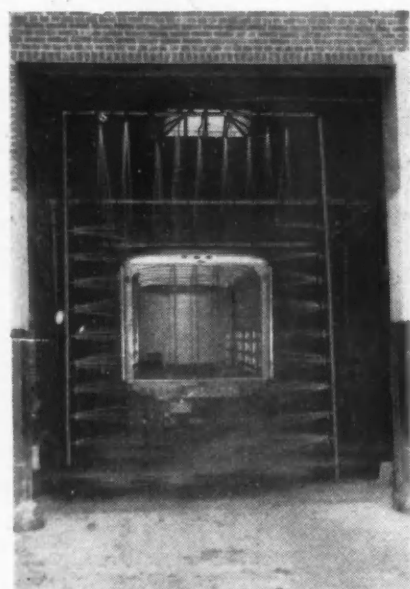


FIG. 3. The one-pipe tunnel uses a three-way valve, provides water or soap

How to Wash a

Often taken entirely too much for granted, good washing procedure calls for proper facilities, well-trained personnel and a study of costs.

Here are some helpful and timely suggestions

THE PRINCIPAL STEPS in washing a vehicle and the basic methods of accomplishing these steps are shown in the box at right. Although they appear at first glance to be both basic and self-evident there are a number of "fine points" in the procedures which have seldom been discussed and which are worthy of the fleetman's attention. These points include a comparison of the different types of equipment available, the relative manpower required and the ultimate costs.

Fountain brushes offer probably the simplest and fastest form of washing since it is continuous through the

first four steps. The change from water to solution and back again being accomplished with a three-way valve, as in the spray frame. Many washers find the entrained weight of water in the brush handle, and the hose attached to the handle end, objectionable.

Long-handled brushes and a pail form the simplest and most popular method of applying the cleaning solution. In this case the use of high-quality brushes is an economy because of their longer life. Also the matting down of a cheap brush can cause injury to painted surfaces.

Air-and-water guns (Fig. 1) are

available from several manufacturers and offer a certain economy in water where that is a factor. Any washing installation can benefit by the use of quick-acting shut-off valves as a great time saver.

Catwalks or galleries (Fig. 4) from which men can reach with brushes all parts of the roofs of large vehicles are worth serious consideration.

There are two forms of spray tunnels. One consists of a frame equipped with nozzles and a three-way valve (Fig. 3). Using plain water, the vehicle is driven through forward. The valve is turned to spray cleaning solution and the vehicle is backed

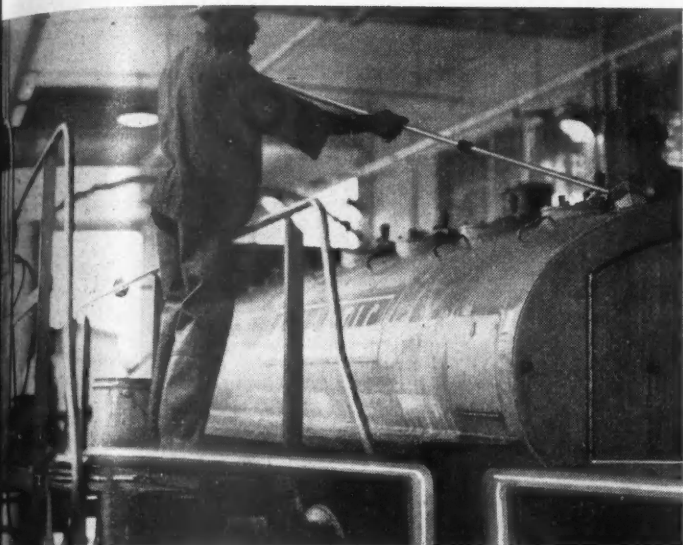


FIG. 4. Gallery or catwalk provides easy access to roof or top surfaces

a Truck

By Harvey H. Earl

Superintendent of Motor Equipment
United Parcel Service, Inc., New York

through. Solution on surface is then agitated by hand brush or rotary brushes. With the spray valve turned to plain water, the vehicle is driven through forward.

This tunnel can consist of one pipe frame and set of nozzles. A better form has two independent pipe frames each equipped with nozzles. This eliminates time lag and solution waste. It also offers the possibility of

EDITOR'S NOTE: This is the concluding portion of a two-part article adapted from a paper presented by Mr. Earl at the SAE Annual Meeting. This first part appeared on page 86 of the March issue.

eliminating the backing operation by spacing the two pipe frames. There are many forms which such a tunnel can take, including mechanical towing of the vehicle and rotary brushes to eliminate much manual labor. One essential element of such a system is the prevention of dirty solution from the roof being left to streak the side panels.

A recent development of this system is to mount a double pipe frame (Fig. 2) with independent nozzles on wheels running on channels on each side of the paved floor. On smaller models, a tank of cleaning solution is carried on the frame, but for larger installations flexible hoses lead from an overhead reservoir of large capacity. Such a system eliminates damage to frames and vehicle, which is possible with the fixed frame system.

Better Supervision Needed

CAR WASHING has never been looked upon as a very highly-skilled form of labor. It has generally been combined with other forms of garage work such as adding oil and water, filling gas tanks, inflating tires and shifting cars. Wage-rates have not been excessive, and not too much attention was paid to it by many executives. Very little training has

SERVICE INSTRUCTIONS

The Principal Steps in Washing a Vehicle

1. Wet Down Thoroughly

- a. By air and water gun
- b. High-pressure water nozzle
- c. Spray tunnel
- d. Fountain brush

2. Apply Cleaning Solution

- a. Air-and-solution spray gun
- b. Spray tunnel
- c. Fountain brush
- d. Plain long handle brush and bucket

3. Agitate Solution on Surface

- a. Fountain brush
- b. Hand brush, sponge or mitt
- c. Rotary brushes

4. Rinse Off Thoroughly

Same method as No. 1

5. Chamois Chrome Plate

By hand

been given the men in spite of considerable turnover due to upgrading. Until quite recently only the largest fleets attempted to systematize and control the operation.

However, increased wage rates and the return of competition are bringing to the attention of management the savings and benefits possible to be derived by better planning and supervision of this item of operational expense.

Washing Facilities

FEW FLEET owners have space for a perfect wash stand. Even where space is available, today's construction costs deter most people from creating the facilities they would like to have. Water lines and drains throughout the garage permit washing in location with elimination of shifting. Efficient washing calls for a great deal of organizing.

Wash stands are all too often located on cold, drafty garage floors, rendering working conditions in winter very undesirable. Wherever possible a sheltered bay should be used and a unit heater installed.

The use of hot water in car washing is entirely unnecessary, certainly at any temperature over 140°. Even

(TURN TO NEXT PAGE, PLEASE)

How to Wash a Truck

Continued from Page 81

[illegible]

then it is doubtful. Too much difference in temperature between the washing water and painted panels results in excessive expansion differentials between the paint and metal panels to which it adheres. For the same reason vehicles should not be washed when their temperature is below freezing. If possible, warm them first in a heated garage.

Excessive heat and air circulation should be avoided to prevent cleaning solutions drying on panels.

Typical Instructions

COMPLETE but simply worded instructions should be printed on waterproof cards and mounted near wash stand. The following is an example:

Car Washing Procedure

1. **Start On Time.** Use four clean washer's pails. Put 8 ounces of chassis soap in each of two pails; put 2 ounces of body soap in each of the remaining two pails and fill with water. Place one pail of each mixture at convenient points on both sides of the wash stand.

2. Place truck on wash stand; fill gas tank and radiator and close all doors and windows. Wet down entire truck, using plenty of water to soften the dirt.

Wash wheels; running gear; bumpers and underneath fenders with chassis soap solution, using fender and spoke brushes. Wash thoroughly and rinse, use plenty of water and pressure if necessary. Do not

at any time allow soap to dry on any part of truck.

3. Wash front and one side of truck using long handled brush and body soap solution, rinse and repeat operation on the other side and back of truck. Use plenty of water when rinsing off soap solution. When using body brush, do not apply too much pressure, as this mats the bristles and scratches the paint. Use sponges to wash places hard to get at. Wipe off all glass with chamois or toweling.

Miscellaneous: Roofs should be washed once a week—use same practice as on body panels.

When the weather permits, the dust may be removed with an ostrich feather duster. However, even in fair weather, panels become filmed and must be washed every few days. Do not dry wipe dirty panels with rags, as this ruins the finish.

One washer should wash not less than 15 package trucks or eight large trucks per night, providing he is not taken from his work.

The dirtiest trucks in station should be washed first each night.

Once a week the interior of all cabs and bodies should be cleaned out. All rubber mattings and wood gratings should be lifted and dirt swept out.

Gasoline tanks and radiators on all trucks must be filled each night, whether washed or not.

For supervision and production control a simple form can be used. This should have a column down the

INSTRUCTIONS

DAILY

STATION MANAGER WILL ENTER A SYMBOL ON THE LINE
FOR EACH CAR, TO INDICATE:

W - CAR WAS WASHED THAT DAY OR NIGHT BEFORE
GOING ON THE ROAD.

D - CAR WAS PROPERLY DUSTED OR WIPED DOWN.

X - CAR DID NOT GO ON THE ROAD (HELD IN RESERVE OR SHOP).

○ - CAR WAS NOT WASHED, DUSTED OR WIPED AND WAS SENT OUT ON THE ROAD.

DAILY AND
END OF WEEK

STATION MANAGER WILL FILL IN:

TOTAL CARS WASHED.

TOTAL CARS USED.

ANALYSIS OF WASHERS' TIME AS TO:

WASHING (INCLUDES PUTTING GAS, OIL AND WATER IN CARS)

OTHER WORK

REMARKS:

THIS REPORT TO BE SENT TO OPERATING PLANT MANAGER AFTER END OF WEEK.

FIG. 5. This two-page control card, 8½ x 11 in. is used by United Parcel Service to record truck cleaning activities. First page gives detailed instructions, reverse side provides complete record of all trucks washed

left side in which all vehicles in the garage can be listed by number. Follow this with six columns for the week's working days and another column in which to indicate the total number of washes for each car. Across the bottom, spaces can be provided to show daily totals of cars used and cars washed. Also the daily total of time spent washing as well as washer's time spent on other work should be provided for.

Approximate Costs

DUE to variations in facilities, other garage duties performed, quality of wash job required, wage rates and other variables already mentioned actual cost comparisons are difficult to obtain. With such reservation, the following are offered:

Lowest cost figures we have seen for near-perfect maintenance of large clear-coated trucks come to about \$20 per year for wages and \$3.25 for soap. These trucks are washed with mops in position, one man wetting them down first and rinsing afterwards, two men washing. Production: 66 trucks per 8-hour night shift.

(TURN TO PAGE 268, PLEASE)



Part 6

(Conclusion)

Own Paint Shops Save Fleets

\$34 to \$54 per Truck

Average costs vary from \$42 to \$80 per vehicle, depending on size; outside shops charge \$82 to \$131. This saving is one reason why fleets say own paint shop is good investment. Other reasons: Convenience, speed, better quality

Analysis by A. W. GREENE, Managing Editor, Commercial Car Journal

THE CONSENSUS of the nation's leading fleets is that having one's own paint shop is a good investment. This is not a matter of opinion. The fleets' statements are based on such concrete facts as dollars and cents, better quality of the finished job, the convenience of fitting the work into operation schedules, shorter time in the paint shop and a number of other reasons.

The cost factor is convincingly shown in Table 1. This table has been divided into two parts to separate the largest fleets from

the medium and smaller fleets to show that large fleets are not the only ones to derive benefits from operating a fleet paint shop.

Table 1 gives the range of costs reported for completely finishing any of six types of vehicles (including lettering and art work), the average for these vehicles and, perhaps most important, the average cost differential in favor of the fleet paint shop.

It will be noticed that the costs reported in the lower half of the table, both by fleet paint shops and outside shops, are higher than those reported by the smaller fleets in

the upper half of the table. No facts were available to ascertain the reason. The only observation that can be made is that, doubtless, the shops of both the fleet paint shops and the commercial paint shops, being very large, have a greater overhead. The probability is the quality of work also is considerably better.

How much fleets pay their paint shop personnel is shown at length in Table 2.

Many fleets said that they did not employ letterers because they use decals for all lettering and illustrations. Their painters or helpers applied these decals. The \$10 rate shown in the For-Hire Carrier Group, Region 2, was given as a flat rate per vehicle. A number of bus fleets also reported flat rates for lettering but these were around \$5 per vehicle.

Fleet Paint Shop Advantages

IN ADDITION to dollar savings on their paint jobs, the fleets gave many other important reasons why they found their paint

Fleets Refinish Own Trucks at Lower Cost than Prevailing Charges by Outside Shops

Q. "How much does it cost you for a complete refinishing job for the various vehicles in your fleet in your own paint shop and/or outside paint shop?"

Fleets Up to 99 Trucks & Truck-Tractors

Table 1

Table 1 Type and Size of Vehicle	Total Number of Fleets Reporting	Total Cost of COMPLETE Refinishing Job				Average Differential in Favor of Own Shop (Per Cent)
		Own Shop		Outside Shop		
		Range (Dollars)	Average	Range (Dollars)	Average	
One SMALL TRUCK	69	9-175	\$42.01	35-160	\$82.16	\$95.57
One MEDIUM TRUCK	67	12-175	51.03	40-300	103.07	101.98
One LARGE TRUCK	59	16-225	65.44	60-350	119.57	82.72
One TRACTOR	37	12-80	42.72	30-150	65.79	54.00
One SEMI-TRAILER	37	20-100	56.27	50-350	132.58	135.61
One FULL TRAILER	4	46-76	55.33	100.00	100.00	80.07

Fleets of 100 and Over Trucks & Truck-Tractors

One SMALL TRUCK	107	14-150	\$48.45	25-195	\$82.81	\$70.09
One MEDIUM TRUCK	102	18-175	65.72	45-200	109.33	66.36
One LARGE TRUCK	97	20-165	80.29	60-245	131.08	63.26
One TRACTOR	55	15-120	49.68	40-135	85.78	72.67
One SEMI-TRAILER	55	20-275	84.46	50-350	157.81	86.85
One FULL TRAILER	24	25-300	90.24	60-165	108.33	20.05

THE VOCATIONAL GROUPS AS USED IN THE TABLES

FOR-HIRE CARRIER—Motor Freight Operators in Local and Over-the-Road Service.
 FOOD DISTRIBUTION—Bakery, Dairy, and Other Food Products fleets.
 GOVERNMENT—State, County, Municipal, and Federal fleets.
 CONSTRUCTION—Builders, Mines, Quarries, Gravel fleets.
 INDUSTRIAL—Fleets operated by manufacturers.
 PETROLEUM—Production and Distribution fleets.
 PUBLIC UTILITY—Gas, Power, Water and Telephone fleets.
 RETAIL DELIVERY—(Other than Food Products) Dry Cleaning, Laundry, Newspaper, Coal & Ice, Department Store, Beverage fleets.
 TRUCK RENTAL—Agencies leasing motor trucks.
 TRUCK & BUS FLEETS, MIXED—Passenger carriers operating own truck fleets.

Appearance
Maintenance

VEHICLE REFINISHING

shops a good investment. Most of these reasons will be found tabulated in Table 3. Some of the reasons included in the "Other" column are: Much time is saved

by not having to drive the vehicles to and from commercial paint shops, own men take more interest in the jobs, easier painting schedules can be maintained and these

readily dovetailed into other maintenance schedules by having the paint shop in the same building, and so on. Most important of all is lower cost.

Fleets Pay Own Painters from \$1.29 to \$1.78 per hour

Q. "What is hourly rate paid Painters, Helpers, Letterers?"

Table 2

VOCATIONAL GROUPS	Total Number of Fleets Reporting	Job Title	REGION I Conn., Del., D. C., Ill., Ind., Iowa, Me., Md., Mass., Mich., Minn., Mo., N. H., N. J., N. Y., Ohio, Pa., R. I., Vt., Wis.		REGION II Ala., Fla., Ga., Ky., La., Miss., N. C., S. C., Tenn., Va., W. Va.		REGION III Ariz., Ark., Colo., Idaho, Kans., Mont., Neb., Nev., N. M., N. D., Okla., S. D., Texas, Utah, Wyo.		REGION IV Cal., Ore., Wash.	
			Dollars & Cents per Hour		Dollars & Cents per Hour		Dollars & Cents per Hour		Dollars & Cents per Hour	
			Range	Average	Range	Average	Range	Average	Range	Average
FOR-HIRE CARRIER.....	19	Painters Helpers Letterers	1.150-2.250 .850-1.250 1.150-4.000	1.548 1.185 2.580	1.200-1.500 .900-1.000 10.00	1.350 950 10.00	1.100-1.500 .880-1.150 1.100	1.300 1.015 1.100	1.558-2.025 1.280	1.777 1.260
FOOD DISTRIBUTION.....	24	Painters Helpers Letterers	.650-1.950 .550-1.500 1.375	1.308 1.043 1.375	1.200-1.450 .900-1.150 1.450	1.300 1.083 1.450	1.400	1.400	1.800 1.550-1.650	1.800 1.600
GOVERNMENT.....	36	Painters Helpers Letterers	1.000-2.060 1.000-1.180 1.000-1.400	1.402 1.093 1.263	.940-1.900 .650-1.750 .940-1.250	1.179 .972 1.073	.625-1.890	1.170	.798-2.000 .648-1.680 1.720	1.638 1.320 1.720
CONSTRUCTION.....	9	Painters Helpers Letterers	1.000-1.750 .900-1.450 1.250-2.500	1.413 1.117 1.800	1.250 .900	1.250 .900	1.000-1.685	1.343	1.750-1.800	1.775
INDUSTRIAL.....	1	Painters Helpers Letterers	1.530 2.000	1.530 2.000						
PETROLEUM.....	4	Painters Helpers Letterers	1.560-1.730 1.400-1.550 1.640-1.920	1.665 1.475 1.780			2.080 1.700	2.080 1.700		
PUBLIC UTILITY.....	17	Painters Helpers Letterers	1.340-2.250 1.150-1.300 1.800-2.000	1.599 1.225 1.783	1.360-1.600 1.000	1.483 1.000	1.500	1.500	1.660-2.680	2.280
RETAIL DELIVERY.....	10	Painters Helpers Letterers	1.250-2.000 .700-1.250 1.500-1.650	1.538 .940	1.100-1.300	1.200			1.700-1.900	1.800
TRUCK RENTAL.....	5	Painters Helpers Letterers	1.500-1.900 1.100-1.550 2.000-2.750	1.650 1.317 2.375	1.500 1.100 1.750	1.500 1.100 1.750				
TRUCK & BUS FLEETS, MIXED.....	7	Painters Helpers Letterers	1.380-1.485 1.100-1.420 1.385-1.480	1.424 1.253 1.420	1.395 1.090 1.395	1.395 1.090 1.395	1.440 1.130 1.440	1.440 1.130 1.440	1.670 1.500	1.670 1.500
TOTAL & AVERAGE ALL VOCATIONS.....	132	Painters Helpers Letterers	.650-2.250 .550-1.550 1.000-4.000	1.468 1.141 1.879	.940-1.900 .650-1.750 .940-1.750	1.292 1.007 1.324	.625-2.080 .880-1.700 1.100-1.440	1.304 1.358 1.270	.798-2.680 .648-1.650 1.720-2.250	1.781 1.482 1.995

Most Fleet Operators Say Own Paint Shop is Good Investment

Q. "Do you think that having your own paint shop is a Good Investment? If 'Yes,' give reasons."

Fleets Up to 99 Trucks & Truck-Tractors

Table 3

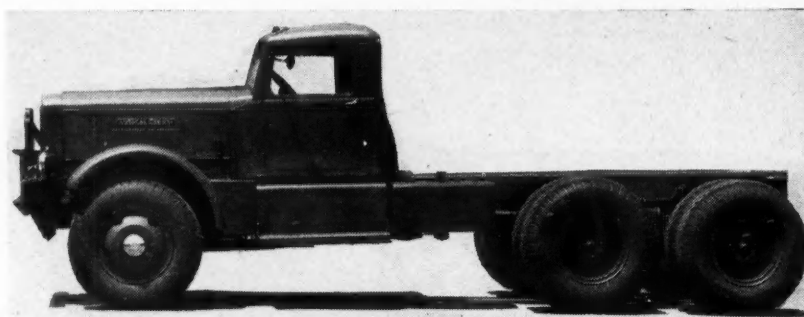
VOCATIONAL GROUPS	Total Number of Fleets Reporting	YES		Number of Fleets Reporting Advantages	Lower Cost per Job		Refinish at Own Convenience	Work Done Faster	Better Quality Job	Constantly Uniform Quality of Work	Finish Surfaces Normally Skipped by Outside Shops	Other
		(Per Cent)	(Per Cent)		(Per Cent)	(Per Cent)						
FOR-HIRE CARRIER.....	14	85.71	14.29	12	83.33	83.33	66.67	50.00	58.33	33.33		
FOOD DISTRIBUTION.....	19	73.68	26.32	14	100.00	100.00	57.14	64.27	64.27	42.86	21.43	
GOVERNMENT.....	22	90.91	9.09	20	75.00	75.00	60.00	50.00	55.00	45.00	15.00	
CONSTRUCTION.....	5	100.00		5	100.00	100.00	40.00	20.00	40.00	20.00		
INDUSTRIAL.....	2	50.00	50.00	1	100.00	100.00						100.00
PETROLEUM.....	1	100.00		1	100.00	100.00	100.00	100.00				
PUBLIC UTILITY.....	10	70.00	30.00	7	85.71	85.71	14.29	57.14	28.57	42.86	14.29	
RETAIL DELIVERY.....	15	73.33	26.67	11	90.91	100.00	63.64	54.55	45.45	54.55	27.27	
TRUCK RENTAL.....	1	100.00		1	100.00	100.00	100.00	100.00			100.00	
TRUCK AND BUS FLEETS, MIXED.....	6	100.00		6	100.00	83.33	100.00	83.33	66.67	66.67		
TOTAL AND AVERAGE.....	95	82.11	17.89	78	88.46	88.46	58.97	55.13	51.28	42.31	15.38	
Fleets of 100 and Over Trucks & Truck-Tractors												
FOR-HIRE CARRIER.....	16	81.25	18.75	13	69.23	76.92	84.62	92.31	76.92	61.54	15.38	
FOOD DISTRIBUTION.....	22	77.27	22.73	17	82.35	88.24	82.35	64.71	70.59	41.18	29.41	
GOVERNMENT.....	31	93.55	6.45	29	89.66	65.52	48.28	55.17	58.62	24.14	13.79	
CONSTRUCTION.....	4	100.00		4	100.00	100.00	25.00	50.00	25.00	50.00		
INDUSTRIAL.....												
PETROLEUM.....	5	80.00	40.00	3	100.00	100.00	100.00	66.67	100.00	66.67	66.67	
PUBLIC UTILITY.....	18	66.67	33.33	12	83.33	50.00	83.33	58.33	66.67	25.00	16.67	
RETAIL DELIVERY.....	8	87.50	12.50	7	85.71	71.43	71.43	100.00	71.43	28.57	14.29	
TRUCK RENTAL.....	6	100.00		6	100.00	83.33	83.33	66.67	33.33	66.67		
TRUCK AND BUS FLEETS, MIXED.....	2	100.00		2	100.00	50.00	100.00	100.00	50.00			
TOTAL AND AVERAGE.....	112	83.04	16.96	93	86.02	73.12	69.89	67.74	63.44	37.63	17.20	

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
C45, C45T, U45, U45T (1948-49)	10	14	25	27	
C50, C50T, U50, U50T (1948-49)	10	14	20	27	
C50D (1948-49)	10	14	20	27	
C5064 (1948-49)	10	14	12ea	27	
C70, C70T (1948-49)	12	18	20	34	
U70, U70T (1948-49)	12	18	20	38	
C70S, C70TS (1948-49)	12	18	18	33	
U70S, U70TS (1948-49)	12	18	18	38	
C70D (1948-49)	12	18	18	34	
C70DS (1948-49)	12	18*	18	33	
C7064 (1948-49)	12	18	12ea	34	
C75T (1948-49)	14	18	18	42	
C8044 (1948-49)	12	18	18	33	
C90 (1948-49)	12	18*	18	33	
C90T (1948-49)	12	18	18	33	
U90, U90T (1948-49)	12	18	18	38	
C90D (1948-49)	12	18	18	33	
C9064 (1948-49)	12	18	20ea	33	
C95T (1948-49)	14	24	18	42	
DC100, DC100T, DC100D (1948-49)	20	18*	18	40	
DC100N, DC100TN, DC100DN (1948-49)	28	18*	18	40	
DC10044N (1948-49)	28	18	18	40	
DC10064 (1948-49)	20	18*	17ea	40	
DC10064N (1948-49)	28	18*	17ea	40	
DC10064S (1948-49)	20	18*	17ea	40	
DC10064SN (1948-49)	28	18*	25ea	40	
DC10064SN (1948-49)	28	18*	25ea	40	

*—Auxiliary Transmission 12 pints.

SERVICE SPECIFICATIONS



AUTOCAR

45, 50, 70, 70S, 75, 8044, 90, 95, DC100 Series

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 106 to 111

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
All Gasoline Models (1948-49)	120*	17	Pos
All Diesel Models (1948-49)	155**	23	Pos

*—2 Batteries; **—4 Batteries.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
All Models with 377, 447, 501 Engines	90-100	120-130	65-75
All Models with HB600 Diesels	430-450	310-330	105-115

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Valve Closes C-After	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Fly-Wheel Teeth °C B-Before A-After	Comp. Pressure at Cranking Speed
				°C	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
45 Series (1948-49), 50 Series (1948-49)	Own 377	6-4x5	40-2450	11°B	4B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	100
70 Series (1948-49)	Own 447	6-4 1/4 x 5 1/4	40-2400	11°B	4B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	95
70 Series (Note A), (1948-49)	Own 447	6-4 1/4 x 5 1/4	40-2400	16°B	6B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	105
70S Series (1948-49)	Own 501	6-4 1/4 x 5 1/4	40-2400	11°B	4B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	95
70S Series (Note B), (1948-49)	Own 501	6-4 1/4 x 5 1/4	40-2400	16°B	6B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	105
75 Series (1948-49)	Con R6572	6-4 1/4 x 5 1/4	60-1800	17°B	.....	.....	.020	.020	CH	5 COM	18mm	.025	C	5°B	.....	.....
80 Series (1948-49)	Own 501	6-4 1/4 x 5 1/4	40-2400	11°B	4B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	95
8044 Series, 90 Series (Note B), (1948-49)	Own 501	6-4 1/4 x 5 1/4	40-2400	16°B	6B	.....	.018	.021	CH	8 COM	18mm	.025	C	6°B	2B	105
95 Series (1948-49)	Con R6602	6-4 1/4 x 5 1/4	60-1800	17°B	.....	.....	.020	.020	CH	5 COM	18mm	.025	C	5°B	.....	.....
DC100 Series (1948-49)	Cum HB600	6-4 1/4 x 6	40-1800	5°B	.....	.....	.020	.020	CH	5 COM	18mm	.025	Diesel	.....	.....	825
DC100N Series (1948-49)	Cum NHB600	6-5 1/4 x 6	40-2100	.....	.....	.....	.017	.027	.....	.....	.....	.025	Diesel	.....	.....	800

Note A—Beginning with Engine No. 45-4541.

Note B—Beginning with Engine No. 60-5561.

C—.018-.024.

VALVE SPRINGS

ENGINE MODEL	VALVE SPRINGS			
	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
377 (1948-49)	110	2 1/2	76	2 1/2
447, 501 (1948-49)	110	2 1/2	76	2 1/2
*447, *501 (1948-49)	132	2 1/2	89	2 1/2
Con R6572, R6602 (1948-49)	170	1 1/4	73	2 1/4
Cum HB600 (1948-49)	136	3 1/4	87	3 1/4
Cum NHB600 (1948-49)	102	3 1/4	72	3 1/4

*—Beginning with 447 Engine No. 45-4541 and 501 Engine No. 60-5561.

†—Free length.

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
C45 (1948-49); C50, C70, C70S, C90 (1948-49)	0-1/4	1	N1-1P	8
C45T, C75T, C95T (1948-49)	0-1/4	1	N3/4-2 1/2P	8
C50D, C5064, C70D, C70DS, C90D (1948-49)	0-1/4	1	N1-1P	8
C7064, C9064 (1948-49)	0-1/4	1	N1-1P	8
C50T, C70T, C70TS, C90T (1948-49)	0-1/4	1	0-2P	8
U45, U45T (1948-49); U50, U50T, U70, U70T, U70S, U70TS, U90 (1948-49)	0-1/4	1	N1 1/2-1 1/2P	8
C8044, DC10044N (1948-49)	0-1/4	0	5P	0
DC100, DC100T (1948-49)	0-1/4	1	0-2P	8
DC100D, DC10064S (1948-49)	0-1/4	1	N1-1P	8
DC10064 (1948-49); DC100TN, DC10064N, DC10064SN (1948-49)	0-1/4	1	0-2P	8

N—Negative.

P—Positive.

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
All Models (1948-49)	(S)30	(M)20	(W)10	140	90	140	90	140	90	140-90

S—Summer. M—Mild. W—Winter.

SERVICE SPECIFICATIONS



BROCKWAY

Models 88WH, 128W, 146W, 148W, 151W, 152W, 153W, 154W, 154WH, 240XW, 260XL, 260XW, 260XWL

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

CAPACITIES

MODEL

MODEL	LUBRICANT CAPACITY			
	Engine Quarts	Transmission Pints	Rear Axle Pints	Cooling System Capacity, Quarts
88WH (1945-49)	7	7	15	25
128W (1947-49)	7	12	20	25
148W (1947-49)	7a	12	31	25
148W (1948-49)	8a	16	31	30
151W (1948-49)	8a	16	31	30
152W (1947-49)	8a	16	31c	32
153W (1948-49)	8a	16	36	32
154W (1947-49)	8a	16	31e	32
154WH (1947-49)	14b	18	30c	40
240XW (1947-49)	14b	18	30c	40
260XW, 260XL, 260XWL (1947-49)	14b	18	34d	40

a—When oil filter is drained add 1 extra qt.
b—When oil filter is drained add 4 extra qts.
c—With 2-speed axle—18 pt.
d—With 2-speed axle—32 pt.

BATTERY

MODEL

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
88WH, 128W, 146W, 148W, 151W, 152W, 153W, 154W	120	17	Pos
154WH, 240XW, 260XL	155	23	Pos
260XW, 260XWL	110*	17	Pos

*—2 Batteries.

TENSIONS

MODEL

MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
All Models	See Continental—Page 110		

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing Cold	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs B-Before A-After	Spark Occurs Flywheel Teeth B-Before A-After	Comp. Pressure at Cranking Speed
				°C	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
88WH (1945-49)	Con 38B	6-3½x4½	40-2000	6½°B	2½B	.022	.017C	.022C	CH	7 COM	18mm	.025	.020	6°B	.....	.....
128W, 146W (1947-49)	Con 40B	6-4x4½	40-2000	6½°B	2½B	.022	.017C	.022C	CH	7 COM	18mm	.025	.020	6°B	.....	.....
148W, 151W, 152W, 153W, 154W (1944-49)	Con 42BX	6-4½x4½	55-2500	16°B	6B	.022	.017C	.022C	CH	7 COM	18mm	.025	.020	6°B	.....	.....
154WH, 240XW, 260XL (1947-49)	Con 46B	6-4½x5½	55-2500	17°B	6½B	.024	.022C	.022C	CH	5 COM	18mm	.025	.020	5°B	.....	.....
260XW, 260XWL (1947-49)	Con 48B	6-4½x5½	55-2500	17°B	6½B	.024	.022C	.022C	CH	5 COM	18mm	.025	.020	5°B	.....	.....

C—Cold.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
88WH, 128W, 146W (1944-49)	110-118	1.52	53-59	1¾
148W, 151W, 152W, 153W, 154W (1944-49)	O. 110-118	1.52	53-59	1¾
154WH (1944-49)	I. 28-32	1½	11.3-14.3	1½
154WH, 240XW, 260XW, 260XL	O. 160-170	1¾	67-73	2¼
260XWL (1944-49)	I. 62-68	1¾	33-37	2¼

O—Outer. I—Inner.

FRONT END

MODEL

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
88WH, 128W, 146W, 148W, 154W, 154WH, 260XL, 260XWL	1/8-1/4	1	1-2	8
151W, 152W, 153W, 240XW, 260XW	1/8-1/4	1	1-2	8

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNIVERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
88WH, 128W, 146W, 148W, 151W, 152W, 153W, 154W (1944-49)	40 above 32°	30 below 32°	90EP	90EP	90EP	90EP	160	110	140
154WH, 240XW, 260XW, 260XL, 260XWL (1944-49)	30 above 32°	30 below 32°	90EP	90EP	90EP	90EP	100	110	140

EP—Extreme pressure lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Pints	
GP (1/2-Ton).....	5	1 1/2*	4 1/2	15	
GR, GT (3/4-Ton).....	5	1 1/2*	6	15	
GS, GU (1-Ton).....	5	6	6	15	
SJ, SK, SL (1 1/2-Ton).....	5	6	11	15**	
SV, SVS, SW, SWS, SX, SP, SPS, SR, SRS, SS, SSS.....	5	6	12	17 1/2	

*—With optional 4-speed transmission, 6 pt.

**—With optional 3-in. core, 17 1/2 qt.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
SL, SX (School Bus).....	125	19	Neg
All Trucks.....	100	15	Neg

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
All Models.....	75-80	100-110*	40-50*

*—With oiled threads.

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Exhaust	Make	Type	Size	Gap				
All Models with 216.5 cu. in. Engine.....	Own	6-3 1/2 x 3 3/4	14-2000	1°A	1 1/2B	.006	.008A	.015B	AC	44-5 Com	14mm	.035	5°B	.....	110
All Models with 235.5 cu. in. Engine.....	Own	6-3 1/2 x 3 1/2	14-2000	1°A	1 1/2B	.010	.008A	.015B	AC	44-5 Com	14mm	.035	5°B	.....	110

A—For heavy duty operation .010

B—For heavy duty operation .020.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
All Models.....	124-140	1 1/2	53-63	1 1/4

FRONT END

MODEL	TOE-IN (In inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
GP (1/2-Ton).....	1/4-1/2	1/4-1/2	1 1/4-2 1/4	7 1/2*
GR (3/4-Ton).....	1/4-1/2	1/4-1/2	2-3	7 1/2*
GT (3/4-Ton Forward Control).....	1/4-1/2	1/4-1/2	2 1/4-3 1/4	7 1/2*
GU (1-Ton Forward Control).....	1/4-1/2	1/4-1/2	1 1/4-2 1/4	7 1/2*
GS, SJ, SK, SL, SV, SVS, SW, SWS, SX.....	1/4-1/2	1/4-1/2	2 1/4-3 1/4	7 1/2*
SP, SPS, SR, SRS, SS, SSS.....	1/4-1/2	1/4-1/2	2 1/4-3 1/4	7 1/2*

*—± 1 deg

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
All Models (1940-49).....	20 above 32	20W@10° to 32°	10W@-10° to 10°*	90	90	90MP	90MP	MP	MP	90

*—10% kerosene below -10°.

MP—"Multi-Purpose" Gear Lubricant.



CHEVROLET

GP, GR, GT, GS, GU, SJ, SK, SL, SP, SPS, SR, SRS, SS, SSS, SV, SVS, SW, SWS, SX

■■■■■■■■■■



Models 18BG,-TG, H18TG, 22BG,-FG,-TG, H22TG, 22TD, H22TD, 25BG,-TG, H25TG, 25TD, H25TD, 26TG, 27TD, H27TD, 28TG, 28TD

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

LUBRICANT CAPACITY

MODEL	Engine Quarts	Transmission Pints	Rear Axle Pints	Cooling System, Quarts
198G.....	9	12	20	26
228G.....	10	18	23	30
258G.....	10	16	31	35
22FG.....	10	16	10	30
18TG.....	9	12	20	28
H18TG.....	9	12	23	28
22TG.....	10	16	23	35
H22TG.....	10	16	31	35
25TG.....	10	15	31	47
H25TG.....	10	15	30	47
28TG.....	10	24	36	53 1/2
22TD.....	15	16	29	35
H22TD.....	15	18	32	35
25TD.....	13	15	32	40
H25TD.....	13	15	34	40
26TG.....	18	24	30	50
27TD.....	20	29	31	50
H27TD.....	20	29	34	50
28TD.....	28	29	38	44

City	Number	Rate	Final	Indexed
Albany	1	1.00	1.00	1.00
Albany	2	1.00	1.00	1.00
Albany	3	1.00	1.00	1.00
Albany	4	1.00	1.00	1.00
Albany	5	1.00	1.00	1.00
Albany	6	1.00	1.00	1.00
Albany	7	1.00	1.00	1.00
Albany	8	1.00	1.00	1.00
Albany	9	1.00	1.00	1.00
Albany	10	1.00	1.00	1.00
Albany	11	1.00	1.00	1.00
Albany	12	1.00	1.00	1.00
Albany	13	1.00	1.00	1.00
Albany	14	1.00	1.00	1.00
Albany	15	1.00	1.00	1.00
Albany	16	1.00	1.00	1.00
Albany	17	1.00	1.00	1.00
Albany	18	1.00	1.00	1.00
Albany	19	1.00	1.00	1.00
Albany	20	1.00	1.00	1.00
Albany	21	1.00	1.00	1.00
Albany	22	1.00	1.00	1.00
Albany	23	1.00	1.00	1.00
Albany	24	1.00	1.00	1.00
Albany	25	1.00	1.00	1.00
Albany	26	1.00	1.00	1.00
Albany	27	1.00	1.00	1.00
Albany	28	1.00	1.00	1.00
Albany	29	1.00	1.00	1.00
Albany	30	1.00	1.00	1.00
Albany	31	1.00	1.00	1.00
Albany	32	1.00	1.00	1.00
Albany	33	1.00	1.00	1.00
Albany	34	1.00	1.00	1.00
Albany	35	1.00	1.00	1.00
Albany	36	1.00	1.00	1.00
Albany	37	1.00	1.00	1.00
Albany	38	1.00	1.00	1.00
Albany	39	1.00	1.00	1.00
Albany	40	1.00	1.00	1.00
Albany	41	1.00	1.00	1.00
Albany	42	1.00	1.00	1.00
Albany	43	1.00	1.00	1.00
Albany	44	1.00	1.00	1.00
Albany	45	1.00	1.00	1.00
Albany	46	1.00	1.00	1.00
Albany	47	1.00	1.00	1.00
Albany	48	1.00	1.00	1.00
Albany	49	1.00	1.00	1.00
Albany	50	1.00	1.00	1.00
Albany	51	1.00	1.00	1.00
Albany	52	1.00	1.00	1.00
Albany	53	1.00	1.00	1.00
Albany	54	1.00	1.00	1.00
Albany	55	1.00	1.00	1.00
Albany	56	1.00	1.00	1.00
Albany	57	1.00	1.00	1.00
Albany	58	1.00	1.00	1.00
Albany	59	1.00	1.00	1.00
Albany	60	1.00	1.00	1.00
Albany	61	1.00	1.00	1.00
Albany	62	1.00	1.00	1.00
Albany	63	1.00	1.00	1.00
Albany	64	1.00	1.00	1.00
Albany	65	1.00	1.00	1.00
Albany	66	1.00	1.00	1.00
Albany	67	1.00	1.00	1.00
Albany	68	1.00	1.00	1.00
Albany	69	1.00	1.00	1.00
Albany	70	1.00	1.00	1.00
Albany	71	1.00	1.00	1.00
Albany	72	1.00	1.00	1.00
Albany	73	1.00	1.00	1.00
Albany	74	1.00	1.00	1.00
Albany	75	1.00	1.00	1.00

MODEL	Amperes Capacity	Number of Pairs	Terminals
188G, 18TG, H18TG, 22BG, 22TG, H22TG, 25BG	100*	13	Pos
22FG	135	19	Pos
25TG, H25TG, 26TG, 26TG	135*	19	Pos
22TD, H22TD, 25TD, H25TD, 27TD, H27TD, 28TD	200**	25	Pos

*—2 Batteries. **—4 Batteries.

Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
100-150	100-150	100-150

185G, 18TG,			
118TG, 22BG,	$\frac{1}{8}$ " 20-25		$\frac{1}{8}$ " 70-75
22FG, 22TG,	$\frac{3}{16}$ " (16)-30-35		$\frac{1}{4}$ " 100-110
H22TG, 25BG,	$\frac{3}{8}$ " (24)-40-45		$\frac{3}{8}$ " 130-140
25TG, H25TG,			$\frac{1}{2}$ " 145-155
26TG, 28TG,			
22TD, H22TD...	158	175	198
25TD, H25TD...	$\frac{5}{16}$ " 175	175	198
	$\frac{1}{2}$ " 280		
27TD, H27TD,			
28TD.....	430-450	310-330	105-115

Standard
Engine
Make
and
Model

TUNE UP	MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)			SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
					°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap					
	18BG, 18TG, H18TG	Con M6330	6-4x4½	40-50-50	6½°B	.....	.022a	.022a	.022ab	AC	84	18mm	C	.020	6°B	.....	108
	22BG, 22TG	Con B6337	6-4½x4½	40-50-50	6½°B	.....	.022	.017	.025b	AC	85	18mm	C	.020	6°B	.....	123
	22TG, H22TG, 25BG	Con B6427	6-4½x5½	40-50-50	6°B	.....	.022	.017	.018B	AC	84	18mm	C	.020	7°B	.....	124
	25TG, H25TG	Con R8513	6-4½x5½	50-60-80	17°B	.....	.0245	.020	.020B	AC	84	18mm	C	.020	5°B	.....	120
	26TG, 26TG	Con R8602	6-4½x5½	50-60-80	17°B	.....	.0245	.020	.020B	AC	84	18mm	C	.020	5°B	.....	120
	22TD, H22TD	Her DWXD	6-4½x4½	50-2800	26°B	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	25TD, H25TD	Her DRXC	6-4½x5½	30-1200	12°B	.....	.016	.016	.108B	.....	.....	.....	.....	.....	.....	.....	475
	27TD, H27TD	Cum H8600	6-4½x6	30-40-1800	5°B	.....	.014	.014	.022B	.....	.....	.....	.....	.....	.....	.....	515
	28TD	Cum H8600	6-5½x6	30-40-2000	20°B	.....	.009	.009	.027B	.....	.....	.....	.....	.....	.....	.....	525

A—With Roto Valves set at .018.

B—With Stellite Valves, increase .003.

C—.018-.020.

Valve Open		Valve Closed	
Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
111-118	1.521	53-59	1½
102-110	1.521	53-59	1½
28-32	1½	11.3-14.3	1½
160-170	1.75	67-73	2.25
82-88	1.75	33-37	2.25
48	1.449	27	1.844
30	1.385	17	1.75
129-143		83-91	3½
102		72	3¼

†—Free length. I—Inner. O—Outer.

MODEL

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
All 2-Wheel Drive (1945-49)	1/8-1/4	1 0	2-3 1/2 5-7	8
All Front Wheel Drive (1945-49)				

ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI- VERSAL JOINT
Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
40 above 90°	30 above 32°	20 below 32°	140	90	140	90	140	140	
50 above 90°	40 above 32°	30 below 32°	140	90	140	90	140	140	140

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
CROSLY—All Models	2	1	1½	4	
DART—100	10	24	38	42	
110	15	24	39	55	
140	28	44	100	59	
200/3010	10	16	28	42	
200/456	10	32	64	42	
250/462	18	28	56	48	
250/472	28	28	56	59	
LINN—All Models	8	2½	6*	18	
MILFORD—QX	8	12	9ea	34	
QYH	10	12	17ea	56	
PETERBILT—280	20	18	26	80	
350	20	18	14ea	80	
360, 370, 380, 390	20	18	20ea	80	

*—Front axle only.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
CROSLY All Models	None	12.5-15	16.5-23
DART 100, 200/3010, 200/456	120-134	129-134	120-125
110	160-170	155-185	
140, 250/472	300	260	263
250/462	175	241-250	72-75
LINN L-2, L-4	52½	Note 1	38½
L-6, L-8	75	Note 1	52½
MILFORD QX	73-75	96-100	67-69
QYH	130-134	130-134	121-125
PETERBILT All Models	430-450	310-330	105-115

Note 1—Front and Inter.—70; Center and Rear—50½

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Exhaust	Make	Type	Size	Gap				
CROSLY—All Models	Own	4-2½x2½	40 @ 30	5°B	1	.005	.004-5C	AL	AN-7E	14mm	.025	.020	8°B	3B	130
DART—100, 200/3010, 200/456	Wau 140GK	6-4½x8½	40	5°A		.010	.012-4C	CH	8 COM	18mm	.025	.018			
110	Det 6094	6-4½x8	30				.012			Diesel					
140, 250/472	Her DFXH	6-5½x8	38				.012								
250/462	Wau 145GK	6-5½x8	40	5°A		.010	.010								
LINN—L-2, L-4	Her QXC3	6-3½x4½	26-1600	5°B		.010	.012-4C	CH	8 COM	18mm	.025	.020			
L-6, L-8	Her JXE3	6-3½x4½	26-1600	5°B		.006	.008	AL	A5	14mm	.025	.018	4°B		
MILFORD—QX	Wau 6MZA	6-4½x8½	40-1500	5°A		.006	.010C	CH	7 COM	18mm	.025	.018	24°B		
QYH	Wau 140GK	6-4½x8½	40-1500	5°A		.008	.010C	CH	7 COM	18mm	.025	.018	TC		115
PETERBILT—All Models	Cum HB600	6-4½x8	55	15°A			.025			Diesel					130

Det—Detroit Diesel (GM).

Z—.025-.030.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
CROSLY—All Models—Intake	51 Max.	1½	30 Max.	1½
Exhaust	51 Max.	1½	30 Max.	1½
DART—All Models—See Listing under Engine Manufacturers, pages 108-111				
LINN—L-2, L-4	37	1.281	19	1.656
L-6, L-8	58	1.594	43	1.920
MILFORD—QX	101	1½	64	2½
QYH	86	1½	31	2½
PETERBILT—All Models	55	1½	26	1½
	136	2½	87	2½

FRONT END

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
CROSLY—All Models	½	2	7½	8½
DART—All Models	½	1	1	8
LINN—All Models	½	¾	2	2
MILFORD—All Models	0-½	1	N1	8
PETERBILT—All Models	0-½	1	1½	8

N—Negative.

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
CROSLY—All Models	30 above 65°	20@10°-65°	90	90	90	90	90	90	
DART—All Models	(S & W) 30	(Extreme Cold) 20	90	140	90	140	90	140	90
LINN—All Models	40 above 90°	30@32°-90°	140	90	140A	90A	140	140	8
MILFORD—All Models	40 above 50°	30@30°-50°	140	90	140	90	140	90	140
PETERBILT—All Models	50 above 90°	40@60°-90°	140	90	140	90	140	90	140

*—10W Below 10°.

S—Summer.

A—Front axle only.

W—Winter.

B—Chassis lube



SERVICE SPECIFICATIONS

CROSLY
LINN

DART
MILFORD

PETERBILT

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111.

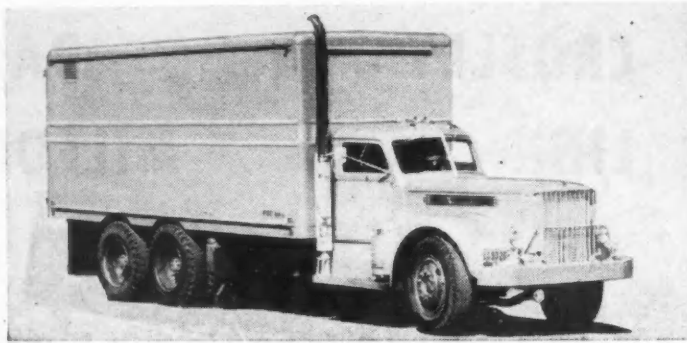
BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
CROSLY—All Models	70	13	Pos
DART—100, 110, 200/300, 200/456	120	17	Pos
140, 250/462, 250/472	168*	17	Pos
LINN—All Models	135	19	Pos
MILFORD—QX	168	21	Pos
QYH	120	17	Pos
PETERBILT—All Models	152*	19	Pos

*—2 Batteries.

**—12 Volt Battery.

SERVICE SPECIFICATIONS



DIAMOND T

Models 201, 306, 404, -SC, 509, -C, -SC, 614, 614C, 702A, 703, 704, 806A, 806C, 809, 901, 910, 910N

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

CAPACITIES

MODEL

MODEL	LUBRICANT CAPACITY			
	Engine Quarts	Trans-mission Pints	Rear Axle Pints	Cooling System Capacity, Quarts
201, 306	6	4 1/2	8	18
404	9	4 1/2	8d	17
404SC	9	4 1/2	11d	23
509	9	4 1/2	8d	28
509SC	9	4 1/2	13d	23
509C	9	4 1/2	11d	28
614	9	12	23d	22
614C	9	12	20	23
702A	9	20	20d	43
703, 704	10	20b	20d	42
806A	8	20b	22d	43
806C	10	20	16	28
809	10	20b	22d	44
901	18	15c	38d	84
910	20	26c	38d	83
910N	50	24c	38d	44

A—With Clark 205V trans.—12 pt.
B—Aux. trans.—8 pt. C—Aux. trans.—12 pt.
D—Capacities shown are for standard axles. The following optional axles are furnished on certain models:

CLARK	TIMKEN	
R-950—9 pt.	L-100—23 pt.	SW-3012—17 pt.
1000—11 pt.	L-300—29 pt.	SD-3010—14 pt.
EATON	R-200—36 pt.	SW-3010—14 pt.
1350—13 pt.	R-300—34 pt.	SD-462W—20 pt.
16500—17 pt.	U-200P—38 pt.	SW-456W—20 pt.
18500—20 pt.	S-200P—38 pt.	SBD1055—19 pt.
18501—20 pt.	U-300—39 pt.	SBD1555—22 pt.
20500—22 pt.		

BATTERY

MODEL

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
201, 306, 404SC	100	a	Pos
404, 509, 509SC, 614, 702A, 703	150	d	Pos
509C, 614C	160	b	Pos
704, 806A, 809, 901, 910, 910N	168	c	Pos

A—SAE No. M. B—SAE No. 7B
C—SAE No. 5H. D—SAE No. 4H.

TENSIONS

See Hercules, Continental Cummins, Pages 108 to 111.

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Flywheel Teeth °C B-Before A-After	Comp. Pressure at Cranking Spd
				°C	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
201, 306	Her QXLD	6-3 1/2 x 4 1/2	25-40	5°B	.....	.008	.008	.010	CH	J10COM	14mm	.027	.020	6°B	.....	.....
404SC	Her JXE-3	6-3 1/2 x 4 1/2	25-40	5°B	.....	.010	.008	.010	CH	J10COM	14mm	.027	.020	6°B	.....	.....
404, 509	Her JXB	6-3 1/2 x 4 1/2	25-40	5°B	.....	.010	.008	.010	CH	J10COM	14mm	.027	.020	6°B	.....	.....
509, 509C, 509SC	Her JXC	6-3 1/2 x 4 1/2	25-40	5°B	.....	.010	.008	.010	CH	J10COM	14mm	.027	.020	6°B	.....	.....
509, 614, 614C	Her JXD	6-4 x 4 1/2	25-40	5°B	.....	.010	.008	.010	CH	J10COM	14mm	.027	.020	6°B	.....	.....
614	Her JXLD	6-4 x 4 1/2	25-40	5°B	.....	.010	.010	.010	CH	J10COM	14mm	.027	.020	6°B	.....	.....
702A, 806A	Her WXLD	6-4 1/2 x 4 1/2	25-40	5°B	.....	.010	.012	.016	CH	J10COM	14mm	.027	.020	TC	.....	.....
703	Con T6427	6-4 1/2 x 4 1/2	25-40	16°B	.....	.022	.017	.017	CH	8 COM	18mm	.025	.020	5°B	.....	.....
704	Her TDXB	6-4 1/2 x 4 1/2	25-30	5°B	.....	.010	.010	.016	CH	J10COM	14mm	.027	.020	2°B	.....	.....
806C	Her WXL-3	6-4 1/2 x 4 1/2	25-40	5°B	.....	.010	.012	.016	CH	J10COM	14mm	.027	.020	TC	.....	.....
809	Con T6427	6-4 1/2 x 4 1/2	25-40	16°B	.....	.022	.017	.017	CH	8 COM	18mm	.027	.020	5°B	.....	.....
901	Con R6572	6-4 1/2 x 5 1/2	50-55	12°B	.....	.024	.020	.020	CH	8 COM	18mm	.025	.020	5°B	.....	.....
910	Cum HB-600	6-4 1/2 x 6	.....	.....	.....	.014	.022	.....	CH	.....	.....	.....	.....	.....	.....	.....
910N	Cum NHB-600	6-5 1/2 x 6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
Her QXD-3, QXLD	48 lb. for 1 in. defl.	.....	2 1/2-2 3/4	2 1/2
Her JXE-3, JXB, JXC, JXD	60-65 at 1.594 length	.....	2 1/2	2 1/2
Her JXLD	112 at 1.628 length*	.....	2 1/2	2 1/2
Her WXL-3, WXLD	97-107 at 2 1/2 length	.....	2 1/2	2 1/2
Her TDXB	47 1/2-52 1/2 at 2 1/2 length	.....	3 1/2	3 1/2
Con T6427	87-10 at 2 1/2	.....	2 3/4	2 3/4
Con R6572	53-59 at 1 1/2 length	.....	1 1/2	1 1/2
Cum HB600	11 1/2-14 1/2 at 1 1/2 length	.....	2 3/4	2 3/4
	67-73 at 2 1/2 length	.....	2 3/4	2 3/4
	32-38 at 2 1/2 length	.....	2 3/4	2 3/4
	129-143 2	.....	83-91	2 1/2

†—Free Length. I—Inner. O—Outer.
*—Data shown with 4 active coils; with 5 active coils; 58.6 lb. at 1.984 in. length.

FRONT END

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
201	1/4	1	3 1/4	9
306	1/4	1	3 1/4	9
404, 404SC, 509, 509SC	1/4	1	1 1/2	9
509C, 614, 614C	1/4	1	1 1/2	9
702A, 703, 704, 806A	1/4	1	2 1/4	8 1/2
806C	1/4	1	1 1/2	9
809	1/4	1	2 1/2	9
901, 910	1/4	1	1 1/2	9

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
201, 306, 404, 404SC, 509, 509SC, 614, 614C, 702A, 703, 806A, 806C, 809, 704, 900, 901, 910, 910N	40 above 32°	30@10° to 32°	20 or 10 below 10°	140	90	A	B	140EP	140EP	140
	40 above 32°	30@10° to 32°	20 or 10 below 10°	50C	50C	A	B	140EP	140EP	140

Note—Heavy-duty detergent (HD) engine oil recommended for heavily worked and highway trucks; premium-type engine oil for city trucks and intermittent operation.

A—All single-speed axles other than hypoid, 140; all 2-speed axles other than hypoid, 90EP or 140EP above 100°; all hypoid axles, 140HYP.

B—All single-speed axles other than hypoid 90; all 2-speed axles other than hypoid, 90EP or 140EP above 100°; all hypoid axles, 90HYP.

C—With 326VO transmission, 90 winter, 140 summer.

EP—Truck-type extreme pressure lube.

HYP—Heavy-duty hypoid lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
B-1-B, B-1-C	5	3 1/2	3 3/4	17 1/2	
B-1-D	5	3 1/2	5 1/2	17 1/2	
B-1-DU, B-1-EU	5	3 1/2	4 1/4	17	
B-1-PW	5	5	6	17	
B-1-F, B-1-H, B-1-FM, B-1-HM	5	6	11	19 1/4	
B-1-FA, B-1-HA, B-1-FMA, B-1-HMA	6	6	13	19 1/4	
B-1-J, B-1-JM	6	11	10	21 1/2	
B-1-JA, B-1-JMA, B-1-KMA	6	11	13	21 1/2	
B-1-KA	6	11	20	21 1/2	
B-1-R	8	11	20	30 1/4	
B-1-RA	8	11	26	30 1/4	
B-1-T	8	11	23	30 1/4	
B-1-TA	8	11	29	30 1/4	
B-1-V	8	11	31	30 1/4	
B-1-VA	8	11	32	30 1/4	
B-1-VX (6 Wheel)	8	11	144	30 1/4	

1—Total of both axles; 1 pint for pillow block.
*—With P.T.O.—6 pints, transfer case—3 pts.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
B-1-B, B-1-C	100	15	Pos
B-1-D	105	15	Pos
B-1-PW	95	15	Pos
B-1-F, B-1-H, B-1-FM, B-1-HM	114	17	Pos
B-1-J, B-1-KA, B-1-JM, B-1-KMA	120	17	Pos
B-1-R	136	17	Pos
B-1-T, B-1-V, B-1-VX	155	19	Pos

TENSIONS

MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
All Models except as listed below.	Nuts 52-57 Cap Screws 65-70		
B-1-R, B-1-T, B-1-V, B-1-VX	55-60 Hot	80-85	45-50
		85-90	50-75

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Fly-Wheel Teeth °C B-Before A-After	Comp. Pressure at Cranking Speed "A"
				°TC	Flywheel Teeth TC	Intake	Exhaust	Make	Type	Size	Gap				
B-1-B, B-1-C	Own 218	6-3 1/4 x 4 1/4	40-800	12°B	5B	.010	.014	AL	A5R	14mm	.038	.020	TC	2°A	120
B-1-D B-1-PW B-1-DU, B-1-EU	Own 230	6-3 1/4 x 4 1/4	40-800	12°B	5B	.010	.014	AL	A5R	14mm	.038	.020	TC	2°A	125
B-1-F, B-1-FA, B-1-H, B-1-HA, B-1-FM, B-1-FMA, B-1-HM, B-1-HMA	Own 237	6-3 1/4 x 4 1/4	40-800	12°B	5B	.010	.014	AL	A5R	14mm	.038	.020	TC	2°A	130
B-1-J, B-1-JA, B-1-KA, B-1-JM, B-1-JMA, B-1-KMA	Own 251	6-3 1/4 x 4 1/4	40-800	12°B	5B	.010	.018	AL	A5R	14mm	.038	.020	2°A	1/4A	130
B-1-R, B-1-RA	Own 282	6-3 1/4 x 4 1/4	45-55-1000	21°B	9B	.010	.018	AL	A5R	14mm	.038	.020	3°B	1.3B	110
B-1-T, B-1-TA, B-1-V, B-1-VA, B-1-VX	Own 331	6-3 1/4 x 5	45-55-1000	21°B	9B	.010	.018	AL	A5R	14mm	.038	.020	TC	2°A	120

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
All Models except as listed below	111	1 1/4	42 1/2	1 1/4
B-1-R, B-1-T, B-1-V, B-1-VX	108	1 1/4	42 1/2	2

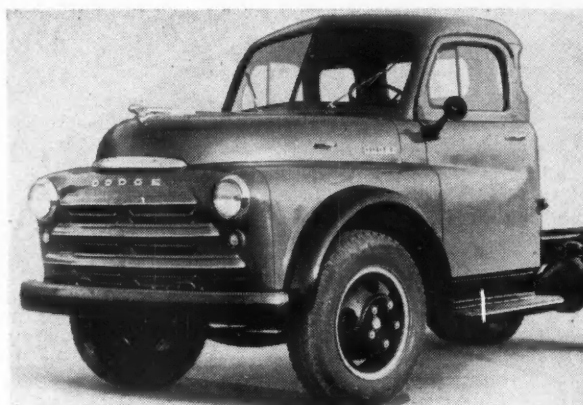
LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
All Models	30 above 32°	20W@10° to 32°	10W below 10°*	90	90A	90B	90A	90	90	140C

*—Use 10% kerosene below -10°. A—Use 80% 90, 20% 10W or straight 80 below -10°. B—With double reduction axles, use 140. C—On 1 and 2-ton models only, use fibre grease.



SERVICE SPECIFICATIONS



DODGE

Series B-1-B, B-1-C, B-1-D, B-1-PW, B-1-F, B-1-H, B-1-J, B-1-K, B-1-R, B-1-T, B-1-V

FRONT END

MODEL	TOE-IN (inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
B-1-PW	0-1/4	1 1/2	1 1/2	Load, 3/4 No Load, 3/4
B-1-B	1/4	1 1/2	1 1/2	Load, 3/4 No Load, 3/4
B-1-C, B-1-D	1/4	1 1/2	1 1/2	Load, 3/4 No Load, 3/4
B-1-DU	1/4	1 1/2	1 1/2	Load, 3/4 No Load, 3/4
B-1-F, B-1-FM, B-1-H, B-1-HM, B-1-J, B-1-KA, B-1-JM, B-1-KMA	1/4-3/8	2	2	Load, 3/4 No Load, 3/4
B-1-EU	1/4-3/8	2	2	Load, 3/4 No Load, 3/4
B-1-R	1/4-3/8	2	2	Load, 3/4 No Load, 3/4
B-1-T	1/4-3/8	1	1 1/2	Load, 3/4 No Load, 3/4
B-1-V, B-1-VX	1/4-3/8	1	2	Load, 3/4 No Load, 3/4

SERVICE SPECIFICATIONS



DUPLEX

Series TH, RH, JH, KH, LH

CAPACITIES

MODEL	LUBRICANT CAPACITY			
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front End Capacity, Quarts
TH	6	11	B	27
TH339	10	11	C	27
RH	7	16	D	32 1/2
JH	10	24A	E	32 1/2
KH, LH	10	24A	F	32 1/2

A—Aux. trans., 8 pt.
 B—With Tim H100, 20 pt.; H200, 28 pt.; H300, 26 pt.
 C—With Tim L100, 23 pt.; L200, 31 pt.; L300, 29 pt.
 D—With Tim Q100, 31 pt.; Q200, 34 pt.; Q300, 32 pt.
 E—With Tim S200, 38 pt.; S300, 39 pt.
 F—With Tim U200, 38 pt.; U300, 39 pt.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Circled
TH, TH339	110	13	Pos
RH, JH, KH, LH	152	19	Pos

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
Her JXD	75	**70	58
Her WXL3	75	**60	52
Her RXB, RXC	75	**63	52
Her RXLD	80	**122	80
Her JXLD	75	**105	80
		175	80
		**70	
		**60	58

*—Front and intermediate.
 **—Center and rear.

TUNE UP

TRUCK MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Fly Wheel Teeth °C B-Before A-After	Crank. Speed at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tapet Clearance for Valve Timing	Intake Exhaust	Make	Type	Size	Gap				
TH	Her JXD	6-4x4 1/4	26-1000	5°B	.....	.006	.008	AL	A5B	14mm	.025	.020	6°B	.....	.....
TH339	Her JXLD	6-4x4 1/4	26-1000	5°B	.....	.006	.008	AL	A5B	14mm	.025	.020	6°B	.....	.....
RH	Her WXL3	6-4 1/2 x 4 1/4	26-1000	5°B	.....	.012	.016	AL	A5B	14mm	.025	.020	TC	.....	.....
JH	Her RXB	6-4 1/2 x 5 1/4	26-1000	2°A	.....	.010	.010	AL	A5B	14mm	.025	.020	.....	.....	.....
KH	Her RXC	6-4 1/2 x 5 1/4	26-1000	2°A	.....	.010	.010	AL	A5B	14mm	.025	.020	.....	.....	.....
LH	Her RXLD	6-4 1/2 x 5 1/4	26-1000	2°A	.....	.010	.010	AL	AT8	14mm	.025	.020	.....	.....	.....

VALVE SPRINGS

ENGINE MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
JXD	58	1.594	43	1.920
WXL3	102	2 1/2	50	2 1/2
RXB, RXC	102	2 1/2	50	2 1/2
RXLD	102	2 1/2	50	2 1/2
JXLD	58	1.594	43	1.920

FRONT END

TRUCK MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
All Models	1/8" - 1/4"	1°	2°	8°

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNIVERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
TH, TH 339	40 above 80°	30@32° to 80°	140	90	140 Hyp	90 Hyp	A	A	B
RH, JH, KH, LH	50 above 80°	40@32° to 80°	149	90	140 Hyp	90 Hyp	A	A	B

Hyp—Hypoid gear lube. A—Special steering gear lube. B—Chassis lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
16M, 18M, 25M, 29M, 629M Series	6	4	6	20	
35M, 635M Series	9	13	8	25	
45M, 645M, 55M, 60M, 65M, 663M, 664M Series	9	13*	12A	25	
65M, 65MA, 663MA, 664MA Series	8	20*	16A	31	
65M, 65MA, 663MA, 664MA Series	8	20*	19	31	
65M, 65MA, 663MA, 664MA Series	10	12**	38	30	
65M, 65MA, 663MA, 664MA Series	14	12**	40	40	
65M, 65MA, 663MA, 664MA Series	14	12**	40A	40	

*—In "MA" Models add 10 pts. for aux. trans.

**—In "MA" Models add 13 pts. for aux. trans.

A—On 6-wheelers, same for each rear axle.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
16M, 18M, 25M, 29M, 629M, 35M, 635M Series	136	17	Pos
45M, 645M, 55M, 60M Series	153	19	Pos
65M, 65MA, 663MA, 664MA Series	153*	19	Pos

*—2 Batteries.

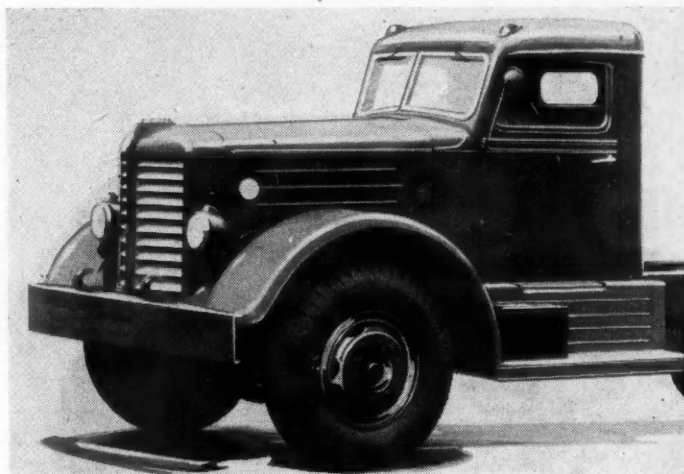
TENSIONS

MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
16M, 18M, 25M, 29M, 629M Series	75	*60 **70	52
35M, 635M, 45M, 645M, 55M, 60M, 65M, 663M, 664M Series	See data under CONTINENTAL, PAGE 110		

*—Center and rear.

**—Front and intermediate.

SERVICE SPECIFICATIONS



FEDERAL

Series 16M, 18M, 25M, 29M, 629M, 35M, 635M, 45M, 645M, 55M, 60M, 65M, 663M, 664M

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Exhaust	Make	Type	Size	Gap				
16M Series (1947-49)	Her JXE	6-3 1/2 x 4 1/4	40-2500	5°A		.008	.008	AC	44	14mm	.025	.020	10°B	35	98
18M Series (1944-49)	Her JXB	6-3 3/8 x 4 1/4	40-2500	5°B		.008	.008C	CH	J10COM	14mm	.025	.020	10°B	35	98
25M Series (1948-49)	Her JXC	6-3 3/8 x 4 1/4	40-2500	5°B		.008	.008C	CH	J10COM	14mm	.025	.020	10°B	35	98
29M Series (1944-49), 629M Series (1948-49)	Her JXD	6-4 x 4 1/4	40-2500	5°B		.008	.008C	CH	J10COM	14mm	.025	.020	10°B	35	98
29ML, 629ML (1948-49)	Her JXLD	6-4 x 4 1/4	40-2500	5°B		.010	.010	CH	J10COM	14mm	.025	.020	10°B		
35M, 635M Series (1948-49)	Con T6371	6-4 1/2 x 4 1/2	40-2500	16°B		.022	.017			18mm	.025				
45M, 55M Series (1944-49), 645M Series (1948-49)	Con T6427	6-4 1/2 x 4 1/2	55-2800	16°B		.022	.017			18mm	.025				
60M Series (1944-49)	Con 22R	6-4 1/2 x 5 1/4	30-1000	5 1/2°B		.014	.012	CH	8COM	18mm	.025	.020	15°B		
65M, 663M, 664M Series	Con R-6602	6-4 1/2 x 5 1/4	55-2800	6 1/2°B			.017	CH	8COM	18mm	.025	.020	7°B		98

C—Cold.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
16M, 18M, 25M, 29M, 629M Series	52	1 1/4	31	1 1/4
29ML, 629ML Series		112 at 1.6	28 length	
35M, 635M, 45M, 645M, 55M Series	O. 129 I. 67	1.458 1 1/4	71 12.8	1 1/4 1 1/4
60M Series	O. 110 I. 50	1 1/2 1 1/4	56 1/2 22 1/2	2 1/4 2 1/4
65M, 663M, 664M Series	O. 160-170 I. 82-88	1 1/2 1 1/4	67-73 33-37	2 1/4 2 1/4

I—Inner. O—Outer.

FRONT END

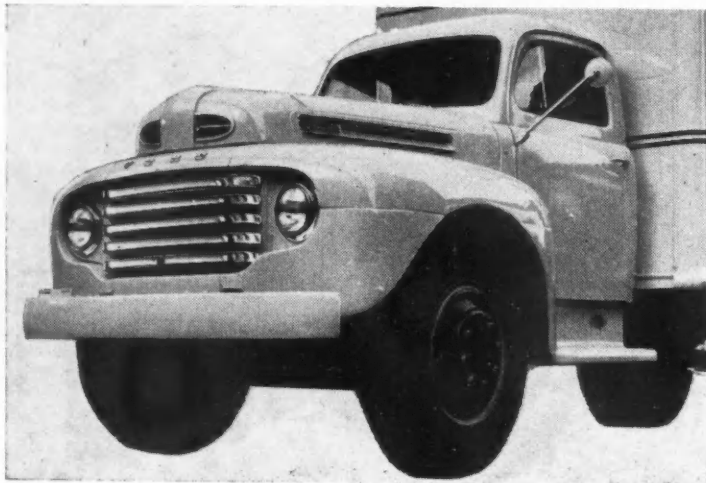
MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
All Models (1944-49)	1/4	1	3	8

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNIVERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
All Models (1944-49)	N-40, H-50 @ 50° to 110°	30@15° to 50°	10W@-20° to 15°	160	90	160	90		160

N—Normal service. H—Heavy duty.

SERVICE SPECIFICATIONS



FORD

Models F-1, F-2, F-3, F-4, F-5, F-6, F-7, F-8

CAPACITIES

MODEL

MODEL	LUBRICANT CAPACITY			
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints
F-1 (8-cyl.)	8	6A	5	18
F-1 (6-cyl.)	6	6A	5	23
F-2 (8-cyl.)	8	6A	5	18
F-2 (6-cyl.)	6	6A	5	23
F-4, F-5 (8-cyl.)	8	6AB	5	18
F-4, F-5 (6-cyl.)	6	6AB	5	23
F-6 (8-cyl.)	8	6AB	10C	18
F-6 (6-cyl.)	6	6AB	10C	23
F-7	12	12	11	23
F-8	12	12	22D	33

A—Capacity shown is for 3-speed transmission; 4-speed transmission—5 pt.
B—F-5 and 5-6 c-o-e—5 pt.
C—Capacity shown is for single-speed axle; 2-speed axle—15 pt.
D—Capacity shown is for single-speed axle; 2-speed axle—19 pt.

BATTERY

MODEL

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
F-1, F-2, F-3, F-4, F-5, F-6	100	17	Pos
F-7, F-8 (& F-5 Sch. Bus)	120	17	Pos

TENSIONS

MODEL

MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
All Models	55-80	95-105	45-50

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
F-1, F-2, F-3, F-4, F-5, F-6 (8 cyl.)	Own 7HT	6-3.3x4.4	50-2000	11°B	TC	.015	A	B	CH	H-9	14mm	C	.025	TC	.....	110
F-1, F-2, F-3, F-4, F-5, F-6 (6-cyl.)	Own 8RT	6-3.1x3.1	50-2000	TC	TC	.015	D	E	CH	H-9	14mm	C	.015	2°B	.....	110
F-7, F-8 (8-cyl.)	Own 8EQ	8-3.1x4.1	50-2000	14°B	TC	O	O	O	CH	H-9	14mm	C	.015	4°B	.....	112

A—.009-.011 cold.

B—.013-.015 cold.

C—.025-.028.

D—.010-.012 cold.

E—.014-.016 cold.

VALVE SPRINGS

ENGINE MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
6-cyl. 226 engine	112-120	1.75	47-53	2.109
6-cyl. 239 engine	76-80	1.84	37-40	2.13
8-cyl. 337 engine	140-152	1.32	63-69	1.68

FRONT END

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
F-1, F-2, F-3, F-4, F-5, F-6	0- $\frac{1}{8}$	$\frac{1}{4}$ to 1	1-3 $\frac{1}{2}$	7 $\frac{1}{4}$ -8
F-5, F-6 (C-O-E)	0- $\frac{1}{8}$	$\frac{1}{4}$ to 1	1-3 $\frac{1}{2}$	7 $\frac{1}{4}$ -8
F-7, F-8	0- $\frac{1}{8}$	$\frac{1}{4}$ to 1	1-3 $\frac{1}{2}$	7 $\frac{1}{4}$ -8

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
F-1	30 above 32°	20W@10° to 32°	140EP	90EP	90Hyp	90Hyp	90EP	90EP	140
F-2, F-3, F-4, F-5	30 above 32°	20W@10° to 32°	140	90	140EP	90EP	90EP	90EP	140
F-6, F-7	30 above 32°	20W@10° to 32°	140	90	140A	90A	90EP	90EP	140
F-8	30 above 32°	20W@10° to 32°	140	90	90AB	90A	90EP	90EP	140

*—Below 10°, use 10% kerosene.

A—Hypoid or multi-purpose lube.

B—Over 100 deg. F., use 140.

EP—Mild extreme pressure gear lube.

Hyp—Hypoid gear lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
HA	10	20	5A	28	
HR, HT, HRT	12	20	5A	28	
SU	12	24	8A	32	
YU (1948-49 only)	16	28	12A	46	
ZU (1948-49 only)	14	28	8A	46	
M7	20	28	18B	64	
M10	20	28	20B	64	
M6X6	20	29	20B	64	
M7D	24	28	18B	64	
M10D	24	28	20B	64	
M6X6D	24	29	20B	64	

A—Same for front axle.
B—Front axle 16.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
HA, HR, HRT, HG, SU*, YU*, ZU*, M6X6*, M7*, M10*	150	19	*Pos
M7D**, M10D**, M6X6D**	150	19	**Pos

*—2 Batteries.

**—4 Batteries.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
Wau BZ	73-75	87-93	66-70
Wau MZA	73-75	96-100	66-68
Wau SRKR	73-75	129-133	121-125
Wau 140 GK	130-134	130-134	96-100
Wau 140 GZ	130-134	130-134	120-125
Wau 145 GK	150	242-250	155-70
Bud 8DC 844	180-180	245-275	150-160

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
HA	Wau BZ	6-4x4 1/2	40-1500	TC	O	.010	A	B	CH	J9	14mm	.025	.020	4°A	1 1/2	109
HR, HG, HRT	Wau MZA	6-4 1/2 x 5 1/2	40-1500	8°B	3B	.008	C	D	CH	7COM	14mm	.025	.020	5°B	2	115
SU	Wau SRKR	6-4 1/2 x 5 1/2	40-1500	8°A	3A	.004	C	E	CH	J9	14mm	.025	.020	4°B	1 1/2	119
YU	Wau 140GK	6-4 1/2 x 5 1/2	40-1500	5°A	1 1/2 A	.010	A	D	CH	6COM	18mm	.025	.020	TC	O	130
ZU	Wau 140GZ	6-4 1/2 x 5 1/2	40-1500	5°A	1 1/2 A	.012	.012	.018	CH	6	18mm	.025	.020	TC	O	130
M7, M10, M6X6	Wau 145GK	6-5 1/2 x 6	40-1500	5°A	2A	.006	F	G	CH	6	18mm	.025	.020	TC	O	120
M7D, M10D, M6X6D	Buda 844	6-5 1/2 x 6 1/2	30-1200	20°B	.....	.010	.015	.015		Diesel						380

A—.010-.012 cold.

B.014-.016 cold.

C—.008-.010 cold.

D—.018-.021 cold.

E—.024-.026 cold.

F—.012-.014 cold.

G—.023-.025 cold.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
HA	101-119	1 1/4	55-66	2 1/8
HG, HR, HRT	93-109	1 1/4	59-69	2 1/8
SU	88-99	2 1/4	64-64	2 1/4
YU, ZU (1948-49)	88-96	2 1/4	31-2	1 1/4
M7, M10, M6X6	108-115	2 1/4	65-75	2 1/4
M7D, M10D, M6X6D	175	2 1/4	65	2 1/4

FRONT END

MODEL	TOE-IN (inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
HA, HR, HRT, HG	1/8-1/4	1	2	8
SU	0-1/8	1 1/2	2	8
YU, ZU (1948-49 only)	1/8-1/4	1	2	8
M7, M10, M6X6, M7D, M10D, M6X6D	1/8	0	5	0

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
HA, HR, HRT, HG	(S)L30, H40	(MW)L20, H30	(W)L10W, H20W	140	90	90MEP	80MEP	140	90	140-90
SU, M7, M10, M6X6	(S)L40, H50	(MW)L30, H40	(W)L20W, H30W	140	90	90MEP	80MEP	140	90	140-90
YU, ZU	(S)L40, H50	(MW)L30, H40	(W)L10W, H20W	140	90	140MEP	90MEP	140	90	140-90
M7D, M10D, M6X6D	60 above 90°	30@32° to 90°	10 below 32°	140	90	90MEP	80MEP	140	90	140-90

H—Heavy duty.

L—Light duty.

MEP—Mild extreme pressure lube.

S—Summer.

W—Winter.

MW—Mild winter.

GMC

Series FC, FP, FF, FFR, AC, AF, EY

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

CAPACITIES

MODEL

LUBRICANT CAPACITY

MODEL	Engine Quarts	Transmission Pints	Rear Axle Pints	Cooling System Capacity, Quarts
FC-100	8*	13	4 1/2	17
FC-150, FP-150	8*	13	6	18
FC-250	8*	13	6	18
FC-300, FCS-300	8*	13	11	18
FC-350, FF-350, FFR-350	8*	13	12	18
FCS-370	8*	12	12	18
FC-450, FF-450, FFR-450, FCS-450	8*	12	20	18
AC-520, ACR-520	10 1/2	12	25-18	18
ACS-520	10 1/2	12	SB-10	18
AF-520, AFR-520	10 1/2	12	25-18	18
AC-600, AF-600	10 1/2	12	SB-18	18
AC-620, ACR-620, AFR-620	11 1/2	14	25-17	22
AC-650, AF-650	10 1/2	12	SB-18	18
AC-700, AF-700, ACT-700, AFT-700	11 1/2	14	SB-18	22
ACW-700, AFW-700	11 1/2	14	SB-22	22
AC-720, AF-720, ACR-720, AFR-720	11 1/2	9	25-18	22
AC-750, AF-750, ACR-750	11 1/2	9	25-20	22
AC-770	11 1/2	14	DR-38	22
AC-800, AF-800, EY-800, AC-850, AF-850, EY-850	11 1/2	9	DR-38	22
ACW-800	11 1/2	9	WD-20	22
ACW-850	11 1/2	9	WD-32	22
AC-870, AC-890	11 1/2	9	DR-20	22

*—Add 2 quarts for filter. 2S—2-speed.
SB—Spiral bevel. DR—Double reduction.
WD—Worm drive.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
FC, FF, FP, FFR thru 450	100	15	Pos
FCS-300, 370, 450	125	19	Pos
AC, AF 520 thru 650	110	17	Pos
AC, AF 700 thru 850	150	19	Pos
AC, AF 870 and 890	175	21	Pos

TENSIONS

ENGINE MODEL	Cylinder Head (pounds feet)	Main Bearings (pounds feet)	Connecting Rod Bearings (pounds feet)
228, 248, 270	70-80	70-80	40-45
308	75-80	75-85	65-75
361, 426, 477	75-80	90-100	90-100

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake	Exhaust	Intake	Exhaust	Make	Type	Size	Gap				
FC-100, 150, 250, 280, FP-150	Own 228	6-3 1/2 x 3 1/2	25-3200*	4°B	.....	.....	.....	.012	.020	AC	44 COM	14mm	.030	A	.....	.....	100
FC, FCS-300, FC, FF, FFR-350, FCS-370	Own 248	6-3 1/2 x 3 1/2	25-2750*	4°B	.....	.....	.....	.012	.020	AC	44 COM	14mm	.030	A	.....	.....	100
FC, FCS, FF, FFR-450	Own 270	6-3 1/2 x 4	25-2750*	4°B	.....	.....	.....	.012	.020	AC	44 COM	14mm	.030	A	.....	.....	100
AC, ACR, ACS-520, AF, AFR, 520, AC, AF-600, AC, AF-650	Own 308	6-3 1/2 x 4 1/2	35-40	14°B	.....	.....	.....	.012	.016	AC	44 COM	14mm	.030	A	TC	.....	100
AC, ACR, AF, AFR-520, AC, ACW, AF, AFW-700, AC-770	Own 361	6-4 1/2 x 4 1/2	35-40	8°B	.....	.....	.....	.012	.016	AC	44 COM	14mm	.030	A	TC	.....	100
AC, ACR, AF, AFR-720, AC, ACW, AF-800, AC-870	Own 426	6-4 1/2 x 5	35-40	8°B	.....	.....	.....	.012	.016	AC	44 COM	14mm	.030	A	TC	.....	100
AC, ACR, AF, AFR-750, EY-800, AC, ACW, AF, EY-850, AC-890	Own 477	6-4 1/2 x 5	35-40	8°B	.....	.....	.....	.012	.016	AC	44 COM	14mm	.030	A	TC	.....	100

*—Used engine; new or rebuilt 15 lb. higher.

A—.018 to .024.

VALVE SPRINGS

ENGINE MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
228	124-140	1.505	54-62	1.621
248	124-140	1.505	54-62	1.621
270	124-140	1.505	54-62	1.621
308	117-125	1 1/2	58-64	1 1/2
361	117-125	1 1/2	58-64	1 1/2
426	117-125	1 1/2	58-64	1 1/2
477	117-125	1 1/2	58-64	1 1/2

FRONT END

MODEL	TOE-IN (inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
FC-100	1 1/4	1°30'	0°20'	7°10'
FC-150	1 1/4	1°30'	0°30'	7°10'
FP-150	1 1/4	1°30'	2°30'	7°10'
FC-250	1 1/4	1°30'	1°	7°10'
FC-300, FCS-300	1 1/4	1°30'	1°15'	7°10'
FC-350	1 1/4	1°30'	0°30'	7°10'
FF-350, FFR-350	1 1/4	1°30'	1°25'	7°10'
FCS-370, FCS-450, FC-450	1 1/4	1°	0°30'	5°
FF-450, FFR-450	1 1/4	1°	1°	5°
AC-520, 550, 600, 620, 650; AF-520, 550, 600, 620, 650; ACR-520, 620; AFR-520	1 1/4	1°	0°30'	8°
AC-700, 720, 750, 770, 800, 850, 870, 890; AF-700, 720, 750, 800, 850; ACR-720, 750; AFR-720	1 1/4	1°	0°45'	8°

* Note: Vehicle light without body; with body add 1/2° to 1° to value given.

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
FC, FCS and FF Series (1947-49)	20 above 32°	10W below 32°	50A	50A	90Hyp(B)	90Hyp(C)	140D	140D	140-80E
AC, ACR, AF Series (1947-49)	30 above 32°	10W below 32°	50A	50A	90Hyp(B)	90Hyp(C)	140D	140D	140-80E

A—Aviation grade engine oil with anti-foam characteristics.

C—Use 80 hyp 0°.

D—Add 3% cylinder oil sodium soap grease.

B—Under severe conditions use 140Hyp.

E—Straight mineral oil.

Hyp—Truck-type hypoid lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
KB-1, KB-2, KB-1M	5	3	4	13 1/4	
KB-3, KB-3M	5	3a	5	13 1/4	
KB-5	5	5 1/2	7	14	
KBS-5	5	5 1/2	13	14	
KB-6	7	7b	7	20 1/4	
KBS-6	7	7b	13	20 1/4	
KB-6F	7	7b	7ea	20 1/4	
KB-7	7	11	17	20 1/2	
KBS-7	9	11c	17	20 1/2	
KB-8	9	11c	17	25	
KBR-8	9	11c	19	25	
KBS-8	9	16d	7ea	25	
KB-8F	9	16d	14	25	
KB-10	9	16d	16	25	
KBR-10	9	16d	21	25	
KBS-10	9	24	38	25	
KB-11, KBR-11	9	24	20	25	
KBS-11	9	24	11ea	25	
KB-12, KBR-12, KB-14	16	26	38	36 1/2	
KBS-12	16	26	37	36 1/2	
W-3042-H	28	18	30	44	
W-4064-H	28	18	17ea	44	
W-6564-OH	28	18	26ea	44	

A—With 4-speed trans., 5 1/2 pt. C—With F-52 trans., 18 pt.
B—With 5-speed trans., 11 pt. D—With F-54b trans., 26 pt.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
KB-1 to KB-5 Series	105	15	Pos
KB-6 and KB-7 Series	136	17	Pos
KB-8 to KB-11 Series	152	19	Pos
KB-12, KBR-14 Series	152*	19	Pos
W Series	200	25	Pos

*—2 Batteries.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds/foot)	Main Bearings (pounds/foot)	Connecting Rod Bearings (pounds/foot)
GRD	65	105	80
BLD	80	105	80
FBC, RED, Int-Con R-5586	110	105	80
Int-Con S-6749	145-155	105	80

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake	Exhaust	Make	Type	Size	Gap				
KB-1, KB-2, KB-3 Series	Own GRD214	6-3 1/2 x 4 1/2	25-600	10°B	.....	.020	F	F	AC	44	14mm	E	D	4°B	107
KB-3, KBS-5	Own GRD233	6-3 1/2 x 4 1/2	25-600	10°B	.....	.020	F	F	AC	44	14mm	D	D	4°B	108
KB-6, KBS-6, KB-6F, KB-7, KBS-7	Own BLD250	6-3 1/2 x 4 1/2	40-1800	5°B	.....	.023	F	F	AC	43	14mm	D	D	3°B	109
KB-7, KBS-7	Own BLD269	6-3 1/2 x 4 1/2	40-1800	5°B	.....	.023	F	F	AC	43	14mm	D	D	3°B	115
KB-8, KBS-8 Series	Own Red 361	6-4 1/2 x 4 1/2	40-1800	8°B	.....	.023	F	F	AC	43	14mm	D	D	4°B	110
KB-10, KBR-10, KBS-10	Own Red 401	6-4 1/2 x 5	40-1800	8°B	.....	.023	F	F	AC	43	14mm	D	D	4°B	115
KB-11, KBR-11, KBS-11, KB-11F	Own Red 450	6-4 1/2 x 5	40-1500	8°B	.....	.023	F	F	AC	43	14mm	D	TC	TC	122
KB-12, KBR-12, KBS-12, KBR-14	Own ConR6586	6-4 1/2 x 5 1/2	50-2600	12°B	.....	.020	.020	CH	5	18mm	.030	D	5°B	5°B	120
W-3042-H, W-4064-H, W-6564-OH	Own ConS6749	6-5 1/2 x 5 1/2	50-2600	17°B	.....	.020	.025	CH	5	18mm	.030	D	5°B	5°B	120

D—.018-.024.

E—.028-.032.

F—.018-.020.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
KB-1 through KB-5 series	85 1/2	1 1/4	47	2 1/4
KB-6, KBS-6, KB-6F, KB-7, KBS-7	93	1 1/4	56	2
KB-8 through KB-11 series	90	1 1/4	40	2 1/4
KB-12, KBR-12, KBS-12, KBR-14	165	1 1/4	70	2 1/4
W-3042-H, W-4064-H, W-6564-OH	86	1 1/4	35	2 1/4
I—Inner. O—Outer.			45	2 1/4

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
KB-1, KB-1M, KB-2, KB-3	1/8-3/8	2	2-3	7 1/2
KB-3M, KB-5, KBS-5	1/8-3/8	1	2-3	8
KB-6 to KBR-14 Series	1/8-3/8	1	1 1/4-1 1/2	4
W-3042-H, W-4064-H, W-6564-OH	1/8-3/8	1	1	4

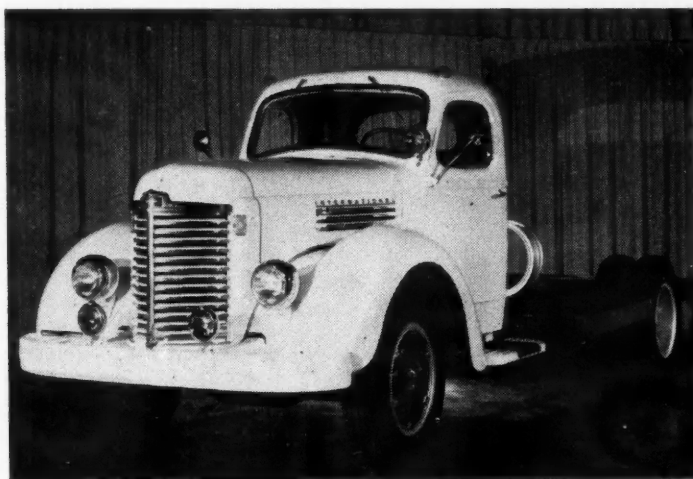
LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
All Models	(S)N30 or 40 (S)H40 or 50	40@32° to 90° 20W@10° to 32°	10W@-10° to 10°	140	90	140A	90A	140	90	140

S—Summer. N—Normal service. H—Heavy-duty service. a—With 2-speed axles and on all west coast models use 90EP below 30°, 140EP above 30°. EP—Truck-type extreme pressure lube.



SERVICE SPECIFICATIONS

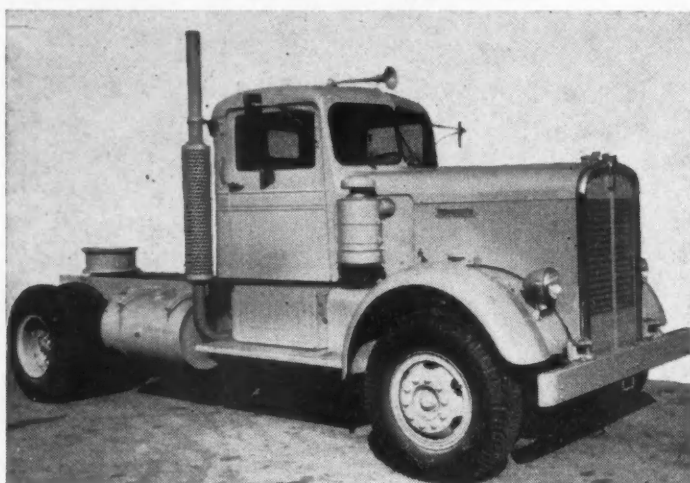


INTERNATIONAL

Series KB-1 through KB-12 and Models
KBR-14, W3042H, W4064H, W6564

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

SERVICE SPECIFICATIONS



KENWORTH

Models 521, 522, 523, 524, 548,
552, 584, 585, 825, 829, 888

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

CAPACITIES

MODEL	LUBRICANT CAPACITY			
	Engine Quarts	Trans-mission Pints	Rear Axle Pints	Cooling System Capacity, Quarts
521, 522	20	18	38	.....
523	20	18	17ea	.....
524	20	18	32ea	.....
548	20	18	28ea	.....
552	20	18	28ea	.....
584	20	18	28ea	.....
585	10	24	38	.....
825	20	18	32ea	.....
829	10	24	14ea	.....
888	28	18	.....	.....

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
All Gasoline Models (1948-49)	168*	21	Pos
All Diesel Models (1948-49)	168**	21	Pos

*—2 Batteries **—4 Batteries.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
Cum HB-600, NHB-600	430-450	310-330	108-115
Bud LO-525	See Data under BUDA, page 108		

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Intake Exhaust	Make	Type	Size	Gap				
521, 522, 523, 524, 548, 552, 584, 825	Cum HB-600	6-4 1/2 x 6	55	5°B	.....	.....	.014	.022		Diesel					525
585, 829	Buda LO-525	6-4 1/2 x 5 1/2	25-1000	10°B	.....	.009	.008	.016		14mm	.025	.020	10°B		.....
888	Cum NHB-600	6-5 1/2 x 6	55	20°B	.....	.....	.014	.027		Diesel					.....

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
521, 522, 523, 524, 548, 552, 584, 825	136	2 1/8	91	2 1/8
888	109	1 1/8	78	2 1/4
585, 829	125-138 at 1 1/8 length			2 1/8*

*—Free length.

FRONT END

MODEL	TOE-IN (inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
521, 522, 523, 524, 548, 585, 825, 829	1/8	1	1 1/2 = 1/4	8
552	1/8	0	5	0
584, 888	1/8	1	1 1/2 = 1/4	0

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
521, 522	(S)30	(W)20	.....	*50	*60	140EP	90EP	140	140	140
523, 524, 548, 552, 584, 825, 888	(S)30	(W)20	.....	*50	*50	140	90	140	140	140
585, 829	(S)30	(W)20	.....	140	90	140	90	140	140	140

S—Summer. W—Winter. *—Straight mineral oil. EP—Extreme pressure lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
DVL-4.....	4 1/4	4	a	2 1/2	17
LD7.....	5	5	3c	2 1/2	21
R-3.....	5	5	3c	2 1/2	23
R-4.....	5	5	3c	2 1/2	23
R-5, R-6.....	5	5	3c	2 1/2	23
Q Series.....	5	5	3c	2 1/2	23
MH440-4.....	16	16	15e	15e	32
MH440-6.....	16	16	15e	15e	32
MH555-4.....	24	24	21f	21f	36
MH555-6.....	24	24	21f	21f	36

a—Front axle only.
c—Front axle, 2 1/2 pt.
e—Front axle, 20 pt.
x—Each of two axles.

b—Front axle, 3 1/4 pt.
d—Front axle, 6 1/2 pt.
f—Front axle, 24 pt.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Term. (no) Grounded
DVL-4.....	120	17	Pos
LD7 and R Series.....	100	17	Pos
Q Series.....	120	17	Pos
MH440-4, MH440-6.....	160	17	Pos
MH555-4, MH555-6.....	120*	13	Pos

*—12-Volt Battery.

TENSIONS

MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
DVL-4.....	60-65	65-70	50-55
LD7, R & Q Series.....	55-60	95-105	45-50
MH440-4, MH440-6.....	60	70*	105
		105**	53†
MH555-4, MH555-6.....	75	105*	105
		123**	115†

*—Center and rear. **—Front and intermediate.
†—With 1/8 in. con. rod. ‡—With 3/8 in. con. rod.

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.H.	Intake Valve Opens B-Before A-After		Intake Tapet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
DVL-4 (1948-49).....	Willys-CJ-3A	4-3 1/2 x 4 1/4	50-30	9°B	.....	.017	.014	.014	AL	AN-7	14mm	.030	.020	TC	TC	115
LD7 and R Series.....	Ford 239	8-3 1/2 x 3 1/4	57-2000	TC	.....	.015	A	B	CH	H-9	14mm	C	.015	2°B	.....	110
Q Series.....	Ford 337	8-3 1/2 x 4 1/4	50-2000	14°B	.....	0	O	O	CH	H-9	14mm	C	.015	4°B	.....	112
MH440-4, MH440-6 (1946-49).....	Her W XLC3	6-4 1/2 x 4 1/4	36-1600	2°A	.....	.010	.008	.010	CH	H-10	14mm	.025	.020	TC	TC	.....
MH555-4, MH555-6 (1946-49).....	Her RXC	6-4 1/2 x 5 1/4	26-2600	2°A	3/4A	.010	.006	.010	CH	NO8	18mm	.025	.020	TC	TC	103

a—.010-.012 cold. b—.014-.016 cold. c—.029-.032.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
DVL-4.....	116	1 1/4	50	2 1/2
LD7 and R Series.....	76-80	1.84	37-40	2.13
Q Series.....	140-152	1.32	62-68	1.68
MH440-4, MH440-6, MH555-4, MH555-6.....	102	2 1/2	50	2 1/2

FRONT END

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
DVL-4.....	0-1/8	3/4	2	9
LD7.....	1-1/8	3/4	1-2	8 1/4
R-3, R-4.....	1-1/8	0	2 1/2	8 1/4
R-5, R-6.....	0-1/8	0	1 1/2	0
Q Series.....	1-1/8	3/4	5	8
MH440-4, MH440-6.....	1-1/8	0	0-1	2
MH555-4, MH555-6.....	1-1/8	0	0-1	1 1/2

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
DVL-4.....	(S)30	(W)20	10W below 10°	140	90	140A	90A	140	140	140
LD7.....	30 above 32°	20W 10° to 32°	10W @ -10° to 10°*	140	90	90B (Hyp)	90B (Hyp)	90EP	90EP	140
R-3, R-4.....	30 above 32°	20W 10° to 32°	10W @ -10° to 10°*	140	90	140B	90B	90EP	90EP	140
R-5, R-6.....	30 above 32°	20W 10° to 32°	10W @ -10° to 10°*	140	90	90B	90B	140	140	140
Q Series.....	30 above 32°	20W 10° to 32°	10W @ -10° to 10°*	140	90	140B	140B	140	140	140
MH Series.....	(S)40	(W)20	10W below 10°	140	90	140B	90B	140	140	140

*—Below -10°, use 10% kerosene. a—Front axle only. b—Same for front axle. (S)—Summer. (W)—Winter. (EP)—Mild extreme-pressure lube. (HYP)—Hypoid gear lube.

SERVICE SPECIFICATIONS



MARMON-HER.

Models DVL-4, LD7 and Q, R, MH Series



SERVICE SPECIFICATIONS



OSHKOSH

Models W312, W1700, W700, W703, W703D, W705, and W1600, W2200 Series

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

CAPACITIES

MODEL

MODEL	Engine Quarts	Transmission Pints	Rear Axle Pints	Coiling System Capacity, Quarts
W-312	7	16a	21k	36
W-1700	10	24a	25b	48
W-700	10	24a	15c	48
W-703, W-705, W-703-D	13	24a	15c	48
W-2200, W-2201	24	22d	24e	80
W-2204	24	22d	40f	80
W-2205	24	29g	40f	80
W-2206	16	29g	40f	80
W-703-6X6	13	24g	32h	48
W-1600 Series	24	22d	25e	84

a—Aux. trans. 6½.
b—Front axle 24.
c—Also front axle.
d—Aux. trans. 17.

e—Front axle 25.
f—Front axle 36.
g—Aux. trans. 12.
h—Front axle 15.
k—Front axle 11.

BATTERY

MODEL

MODEL	Amp. Hr. Capacity	Number of Cells	Terminal Grounded
All Gasoline Models	153	19	Pos
All Diesel Models	204	25	Pos

TENSIONS

ENGINE MODEL

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
Her WXLCO-3	85	Note 1	83
Her RXC, RXCO	85	Note 2	118
Her RXLD	100	175	188
Her DRXC	Note 3	175	188
Cum HB-600	430-450	310-330	105-115
Bud 6DC-844	Note 4	245-275	150-180
Bud 6DCS-844	Note 4	245-275	150-180
Bud 6MO-779	Note 4	245-275	150-180
Bud 6M-893	Note 4	245-275	150-180
Hall-Scott 400	Note 5	180-200	130-140

Note 1—Front intermed. 105; CTR & RR 70.
Note 2—Front intermed. 123; CTR & RR 105.
Note 3—¾"-175, 1"-250.
Note 4—¾"-85-105; ¾"-150-160.
Note 5—Large 230-250; small 30-40.

TUNE UP

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at R.P.M.	Intake Valve Opens B-Before A-After		Intake Tapet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Flywheel Teeth B-Before A-After	Compression Pressure at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
W-312	Her WXLCO-3	6-4½x4½	26-1600	2"A	.....	.012	.012	.016	CH	J-10	14mm	.025	.020	.....	.....	.....
W-1700	Her RXC	6-4½x5½	36-1600	2"A	.....	.010	.010	.016	CH	0 COM	½"-18	.025	.020	.....	.....	.....
W-700	Her RXCO	6-4½x5½	36-1600	2"A	.....	.010	.010	.016	CH	0 COM	½"-18	.025	.020	.....	.....	.....
W-703, W-705, W-703-6X6	Her RXLD	6-4½x5½	36-1600	2"A	.....	.010	.010	.016	CH	0 COM	½"-18	.025	.020	.....	.....	.....
W-703-D	Her DRXC	6-4½x5½	30-1200	12"B	.....	.016	.016	.016	CH	8 COM	18mm	.027	.018	.....	.....	.....
W-2200	Bud 6MO-779	6-5½x6	35-1800	20"B	.....	.018	.015	.015	CH	8 COM	18mm	.027	.018	.....	.....	.....
W-2201, W-1600-BG	Bud 6MO-893	6-5½x6	35-1800	20"B	.....	.018	.015	.015	CH	8 COM	18mm	.027	.018	.....	.....	.....
W-2204, W-1600-BD	Bud 6DC-844	6-5½x6	35-1800	20"B	.....	.018	.015	.015	CH	8 COM	18mm	.027	.018	.....	.....	.....
W-1600-CD	Cum HB-600	6-4½x6	35-1800	5"B	.....	.014	.022	.....	CH	Die sel	.....	.....	.....	.....	.....	.....
W-2205	Bud 6DCS-844	6-5½x6½	30-1200	45"B	.....	.010	.015	.015	CH	Die sel	.....	.....	.....	.....	.....	.....
W-2206	Hall-Scott 400	6-5½x7	85-1600	55"B	.....	.021	.030	.....	CH	A	18mm	B	.....	.....	.....	.....

A-Two per cent; exhaust No. 6 intake No. 9
B-.018-.022

A—Two per cyl.; exhaust No. 6, intake No. 9.

B—.018-.022.

VALVE SPRINGS

ENGINE MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
Her WXLCO-3, RXC, RXCO, RXLD	102	2½	50	2½
Her DRXC	48	1.449	27	1.844
	30	1.355	17	1.750
Cum HB-600	129-143	2	83-91	2½
Bud 6MO-779, 6MO-893, 6DC-844, 6DCS-844	144-155	2½	82-89	2¾
Hall-Scott 400	243	2.000	115	2.485
	243	1.941	115	2.423

O—Outer.

I—Inner.

FRONT END

MODEL

MODEL	TOE-IN (inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
W-312, W-1700, W-700, W-703, W-705, W-703-D, W-703-6X6	0-½	1°	1°	3½
W-2200, W-2201, W-2204, W-2205, W-2206, W-1600	0-½	½°	1°	¾

LUBRICATION

ENGINE MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNIVERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
W-312	40 above 40°	30@10° to 40°	20 below 10°	140A	90A	140Hyp	90Hyp	140A	140A	C
W-1700, W-700, W-703, W-705, W-703-6X6	40 above 40°	30@10° to 40°	20 below 10°	140A	90A	140A	90A	140A	140A	C
W-703-D	40 above 40°	30@32° to 60°	20 below 32°	140A	90A	140A	90A	140A	140A	C
W-1600-CD	30 above 80°	20@20° to 80°	10 below 20°	140A	90A	140A	90A	140A	140A	C
W-2200, W-2201, W-2204, W-2205, W-1600-BG, W-1600-BD	40 above 90°	30@32° to 90°	20 below 32°	140A	90A	140A	90A	140A	140A	C
W-2206	30 above 32°	20 below 32°	.....	140A	90A	140A	90A	140A	140A	C

A—Straight mineral oil gear lubricant; same for front axle, aux. trans. & transfer case. Hyp—Hypoid gear lubricant front and rear axles, W-312 only. C—Light weight chassis lubricant.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
D-19, D-19X	8	6	9a	17½	
D-21	8	6	13b	20	
D-21R, D-22	12	12	20c	20	
D-22R	12	12	23d	20	
D-22R	12	12	22e	20	
D-23S	20	12	12	27	
D-23	20	20	23f	28	
D-23R	8	20	31g	28	
D-23R	8	20	14h	28	
30, 31	14	15	38h	47	
316	14	15	32e	47	

a-Quantity shown is for single reduction spiral; with hypoid, 13 pt.; with two-speed, 15 pt.
b-Quantity shown is for single speed; two-speed, 15 pt.
c-Quantity shown is for single reduction; double reduction, 28 pt.; two-speed, 26 pt.
d-Quantity shown is for single reduction; double reduction, 31 pt.
e-Each axle (tandem).
f-Quantity shown is for single speed; two-speed, 29 pt.
g-Quantity shown is for single reduction; double reduction, 38 pt.; two-speed, 32 pt.
h-Quantity shown is for single speed; two-speed, 39 pt.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
D-19, D-19X, D-21, D-21R, D-22, D-22R, D-226R 6-Volt Trucks	136	17	Pos
D-19, D-19X, D-21, D-21R, D-22, D-22R, 6-Volt Tractors	153	19	Pos
D-23S, D-23, D-23R, D-236 6-Volt Trucks	153	19	Pos
D-23S, D-23, D-23R, D-236 6-Volt Tractors	170	21	Pos
D-23S, D-23, D-23R, D-236 12-Volt Truck or Tractors	136*	17	Pos
30, 31, 316 12-Volt	153*	19	Pos

*-2 Batteries.

TENSIONS

MODEL	Cylinder Head (pounds foot)	Main Bearings (pounds foot)	Connecting Rod Bearings (pounds-foot)
D-19, D-19X, D-21, D-21R, D-22, D-22R, D-226R	83-100	67-75	70-75
All Others	See Continental, page 110		

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
D-19, D-19X	Own G.C. 245	6-3½"x4¼"	40	5°B	.....	.012	.008	.010	CH	J-11	14mm	.025	A	8°B	3B	105
D-21	Own G.C. 288	6-3½"x5"	40	5°B	.....	.012	.008	.010	CH	J-11	14mm	.025	A	8°B	3½B	105
D-21R	Own G.C. 310	6-3½"x5"	40	5°B	.....	.012	.008	.010	CH	J-11	14mm	.025	A	8°B	3½B	105
D-22, D-22R, D-226R	Own G.C. 310H	6-3½"x5"	40	5°B	.....	.012	.008	.010	CH	J-11	14mm	.025	A	8°B	3½B	105
D-23S	Con T-6371	6-4½"x4½"	40-60	16°B	.....	.022	.017	.017	CH	8 COM	18mm	.030	A	6°B	.....	110
D-23, D-23R, D-236	Con T-6427	6-4½"x4½"	40-60	16°B	.....	.022	.017	.017	CH	8 COM	18mm	.030	A	6°B	.....	110
30	Con R-6513	6-4½"x5½"	40-60	12°B	.....	.022	.020	.020	CH	8 COM	18mm	.030	A	6°B	.....	105
31, 316	Con R-6602	6-4½"x5½"	40-60	12°B	.....	.022	.020	.020	CH	8 COM	18mm	.030	A	6°B	.....	105

A-.018 to .024

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
D-19, D-19X, D-21, D-21R, D-22, D-22R, D-226R	135-140	2½	50-54	2½
D-23S, D-23, D-23R, D-236	124-134	1.458	67.5-74.5	1½
30, 31, 316	54-64	1½	11.3-14.3	1½
	67-73	2½	160-170	1½
	33-37	2½	82-88	1½

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
D-19	30 above 32°	20W@0° to 32°	10W below 0°	50	50	*90	*90	90	90	.....
D-19X, D-226R	30 above 32°	20W@0° to 32°	10W below 0°	50	50	90	90	90	90	.....
D-21, D-21R, D-22, D-22R	30 above 32°	20W@0° to 32°	10W below 0°	50	50	*140	*90	90	90	.....
D-23S, D-236, 316	30 above 32°	20W@0° to 32°	10W below 0°	90	90	90	90	90	90	.....
D-23, D-23R, 30, 31	30 above 32°	20W@0° to 32°	10W below 0°	90	90	*140	*90	90	90	.....

*-With all hypoid axles use Elco No. 28, 140 in summer, 90 in winter.



SERVICE SPECIFICATIONS



REO

Series D-19, D-21, D-22, D-23, D-226,
D-236, 30, 31, 316

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
D-19, D-19X, D-21	½-¾	1	2	8
D-21R, D-22, D-22R, D-226R	½-¾	1	2½	8
D-23S, D-23, D-23R, D-236	½-¾	1	1½	8
30, 31, 316	½-¾	1	2	8



STERLING

Series DD, HBS, HC, HCS, HD, HDS, HWS

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
HD97, HD105, HA1401, DD115, HD115, HD145, HC97, HC105, HC115, HC144, HC147, HC155, HBS130, HDS140, HWS160, HA2205, DDS160, HCS195, HWS235G, HC175, HC250, DD145, HWS235, HCS265, HCS297, HCS330, HD115H, DD145H, HD145H, HC115H, HC175H, HC250H, HWS160H, HWS235H, HCS195H, HCS265H, HCS297H, HCS330H	170 170*	23 23	Pos Pos
	204*	25	Pos
	170*	21	Pos

*—Two Batteries.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds feet)	Main Bearings (pounds feet)	Connecting Rod Bearings (pounds feet)
Wau 6MZA	73-75	96-100	67-69
Wau 6SRKR	73-75	129-133	121-125
Wau 140GK	130-134	130-134	121-125
Wau 145GK	130-134	242-250	73-75
Cum HB600	430-450	310-330	105-115
Cum NHBD600	430-450	310-330	105-115

CAPACITIES

MODEL	LUBRICANT CAPACITY				
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	Cooling System Capacity, Quarts
HD97	8	16	31	34*	
HD105	8	16	30	34*	
HA1401	8	16	18	34*	
DD115	10	24a	16b	38*	
HD115	10	24	38	38*	
DD145	18	17g	16b	62*	
HD145	10	24	24	38*	
HD115H	20	17	38	66*	
DD145H	20	17g	16b	66*	
HD145H	20	17	24	66*	
HC97	8	16	12	34*	
HC105	8	16d	13c	34*	
HC115, HC144, HC147	10	24d	12c	38*	
HC155	10	24d	20c	38*	
HC175, HC250	18	17d	20c	62*	
HC115H	20	17e	20c	66*	
HC175H, HC250H	20	17e	20c	66*	
HBS130	8	16	22f	34*	
HDS140	8	16	14f	34*	
DDS160	10	24	14f	38*	
HWS160	10	24	14f	38*	
HA2205	10	24	14f	38*	
HWS235G	10	24	32f	38*	
HWS235H	18	17	32f	62*	
HWS160H	20	17	17f	66*	
HWS235H	20	17	32f	66*	
HCS195	10	24e	24c	38*	
HCS265	18	17d	15h	62*	
HCS297, HCS330	18	17d	15h	62*	
HCS195H	20	17e	24c	66*	
HCS265H	20	17d	15h	66*	
HCS297H, HCS330H	20	17d	15h	66*	
HCS340H	28	21e	19h	62*	

*—Varies with optional radiators.

a—Transfer Case—4 Pts.

b—Capacity of Front Driv-

ing Axle—24 Pts.

c—Auxiliary Trans.—17 Pts.

d—Jackshaft Oil Capacity.

e—Auxiliary Trans.—17 Pts.

f—For Each Axle. g—Transfer Case—5 Pts. h—Pounds.

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Exhaust	Make	Type	Size	Gap				
HD97, HD105, HA1401, HC97, HC105, HBS130, HDS140, DD115, HD115, HD145, HC115, HC144, HC147, HC115, HWS160, HCS195, HA2205, HWS235G, DDS160, HC175, HC250, DD145, HCS265, HCS297, HCS330, HD115H, DD145H, HD145H, HC115H, HC175H, HC250H, HWS160H, HWS235H, HCS195H, HCS265H, HCS297H, HCS330H, HCS340H	Wau 6MZA Wau 6SRKR Wau 140GK Wau 145GK Cum HB600 Cum NHBD600	6-4 1/4 x 4 3/4 6-4 1/2 x 5 1/2 6-4 1/2 x 5 1/2 6-5 1/4 x 6 6-4 7/8 x 6 6-5 1/2 x 6	40-1500 40-1500 40-1500 40-1500 30-40-1800 40-2100	8°B 8°A 5°A 5°A 5°B 20°B	3B 3A 1 1/4 A 2A	.008 .004 .010 .006 .014 .014	.008-10C .008-10C .010-12C .009-11C .022 .027	.018-21C .024-26C .016-18C .024-26C	AL AL AL AL Diesel Diesel	BT4 TT8 BT4 BT4	18mm 3/8 18mm 18mm	.025 .025 .025 .025	.018 .018 .018 .018	Var Var Var Var	110 86 130 130 825 825

VALVE SPRINGS

ENGINE MODEL	VALVE SPRINGS			
	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
6MZA	101	1 1/2	64	2 1/2
6SRKR	101	2 1/2	66	2 1/2
140GK	86	1 1/2	31	2 1/2
	55	1 1/2	26	1 1/2
145GK	118	2 1/2	48	2 1/2
	81	2 1/2	32	2 1/2
HB600	129-143	2 1/2	83-91	2 1/2
NHBD600	104-114	1 1/2	74-82	2 1/4

I—Inner. O—Outer.

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
HD97, HD105, HC97, HA1401, HC105, HBS130, HDS140, HD115, HD145, HD115H, HD145H, HC115, HC144, HC147, HC155, HC115H, HWS160, HWS160H, HCS195, HCS195H, HA2205	1/4" ± 1/8"	1	Var	8
DD115, DDS160, DD145H, DD145	1/4" ± 1/8"	0	Var	0
HC175, HC250, HC175H, HC250H, HWS235, HWS235H, HCS265, HCS297, HCS330, HCS265H, HCS297H, HCS330H, HWS235G, HCS340H	3/8" ± 1/8"	1	Var	8

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNIVERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
HD97, HD105, HD115, DD115, HA1401, HD145, DD145, HD115H	40 50°-70°**	30 30°-50°	20W Below 30°	140	90	140Hyp	90Hyp	140	140
DD145H, HC175H, HC250H, HWS235H	40 50°-70°**	30 30°-50°	20W Below 30°	140	90	140Hyp	90Hyp	140	140
HD145H, HC115H, HWS160H, HCS195H	20 20°-80°***	10 Below 20°		140	90	140	90	140EP	140EP
HC97, HC105, HC115, HC144, HC147, HC155, HBS130, HDS140, HWS160, DDS160, HA2205, HCS195, HC175, HC250, HWS235, HWS235G	40 50°-70°**	30 30°-50°	20W Below 30°	140	90	140	90	140	140
HCS265, HCS297, HCS330, HCS265H, HCS297H, HCS330H, HCS340H	40 50°-70°**	30 30°-50°	20W Below 30°	140	90	(SS)	(SS)	140EP	140EP
	20 20°-80°***	10 Below 20°		140	90	(SS)	(SS)	140EP	140EP

(SS)—Special Sterling Lubricant.

Hyp—Hypoid gear lube.

EP—Extreme pressure lube.

*50 above 70°.

**30 above 80°.

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
2R5.....	5	2 1/2 ^a	3	10 ^c	
2R10.....	5	2 1/2 ^a	3	10 ^c	
2R15.....	5	6	6 1/2	10 ^c	
2R16A.....	6	7 1/2	15 1/2 ^d	15 1/2 ^d	
2R17A.....	6	6	18 1/2 ^d	15 1/2 ^d	

^a—With overdrive - 3 1/4 pt.
With 4-speed trans. - 6 pt.

^b—With 2-speed axle 14 pt.

^c—13 1/2 qt. optional
^d—16 qt. optional

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
All Models*	100	15	Pos

*—Optional battery 153-19 Pos.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds foot)	Main Bearings (pounds foot)	Connecting Rod Bearings (pounds foot)
2R5, 2R10, 2R15, 2R16A, 2R17A...	46-50 80-85	88-93 88-93	28-32 52-54

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake	Exhaust	Intake	Exhaust	Make	Type	Size	Gap				
2R5, 2R10.....	Own 1R	6-3x4	40 Min.	15°B	5B	.020	.016C	.016C	.016C	CH	J7	14mm	.025	.020	2°B	1/2°B	105
2R15.....	Own 2R	6-3x4	40 Min.	15°B	5B	.020	.016C	.016C	.016C	CH	J7	14mm	.025	.020	2°B	1/2°B	105
2R16A, 2R17A.....	Own 4R	6-3 1/2 x 4 1/4	40 Min.	15°B	5 1/2 B	.020	.016C	.016C	.016C	CH	J7	14mm	.025	.020	2°B	1/2°B	105

C—Cold.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
2R5, 2R10, 2R15.....	93-103	1 1/4	37-41	1 1/4
2R16A, 2R17A.....	125-135	1 1/4	54-60	2 1/4

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
2R5, 2R10.....	1/8 - 1/4	1	1 1/4 - 1 1/2	7 1/4
2R15.....	1/8 - 1/4	1	1 1/4 - 1 1/2	8
2R16A, 2R17A.....	1/8 - 1/4	1	2 1/4 - 3 1/4	8

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
2R5.....	30 above 32°	20 10° to 32°	10 below 10°	90g	90g	90Hyp	90Hyp	J	J	K
2R10.....	30 above 32°	20 10° to 32°	10 below 10°	90g	90g	140	90h	J	J	K
2R15.....	30 above 32°	20 10° to 32°	10 below 10°	140	90h	140	90h	J	J	K
2R16A (L).....	30 above 32°	20 10° to 32°	10 below 10°	140	90h	140	90h	J	J	K
2R17A (L).....	30 above 32°	20 10° to 32°	10 below 10°	140	90h	140Hyp	90Hyp	J	J	K

G—If equipped with overdrive use 90 mineral gear lube or 40 engine oil. H—Below 32° only.

J—Special lubes approved by Roes Tool & Gear Co.

K—Chassis lube—low pressure gun.

Hyp—Truck type hypoid lube.

L—2-speed rear axle (optional) 90 hyp. below 32° and 140 hyp. above 32°



STUDEBAKER

Models 2R5, 2R10, 2R15, 2R16A, 2R17A

SERVICE SPECIFICATIONS



WALTER

Models FGB, FGR, FC, FCK, FKM, FN, FZM

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

CAPACITIES

MODEL

MODEL	Engine Quarts	Trans- mission Pints	Rear Axle Pints	Feeding System Capacity, Quarts
FGB, FGR (1943-49)	18	32	8	50
FC, FCK (1938-49)	10	25	7	42
FKM (1938-49)	10	17	5	38
FM-FZM (1938-49)	8	17	5	32

LUBRICANT CAPACITY

MODEL	Engine Quarts	Trans- mission Pints	Rear Axle Pints	Feeding System Capacity, Quarts
FGB, FGR (1943-49)	18	32	8	50
FC, FCK (1938-49)	10	25	7	42
FKM (1938-49)	10	17	5	38
FM-FZM (1938-49)	8	17	5	32

BATTERY

MODEL

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
FN, FZM (1943-49)	160	17	Pos
FC, FCK, FKM (12 Volts) (1943-49)	120*	15	Pos
FGB, FGR (12 Volts) (1943-49)	160*	17	Pos

*—2 Batteries.

TENSIONS

MODEL

MODEL	Cylinder Head (pounds feet)	Main Bearings (pounds feet)	Connect- ing Rod Bearings (pounds- feet)
FN, FZM	73- 75	96-100	67- 69
FKM, FCK, FC, FCR	73- 75	129-133	121-125
FGB, FGR	130-134	242-250	73- 75

TUNE UP

MODEL

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tapet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly- Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
FN, FZM (1943-49)	Wau MZR	6-4 1/4 x 4 3/4	40-1500	8°A	3A	.004	.008-10C	.014-16C	Opt	.....	18mm	.025	.018	Var	.....	90
FKM, FCK, FC, FCR (1943-49)	Wau SRKR	6-4 3/8 x 5 1/8	40-1500	8°A	3A	.004	.008-10C	.014-16C	Opt	.....	1/8	.025	.018	Var	.....	90
FGB, FGR (1943-49)	Wau 146GK	6-5 1/4 x 6	40-1500	5°A	2A	.006	.009-11C	.024-26C	Opt	.....	18mm	.025	.018	Var	.....	130

C—Cold.

VALVE SPRINGS

MODEL

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
FN, FZM	101	1 11/16	64	2 11/16
FKM, FC, FCK, FCR	94	2 1/16	59	2 3/16
FGB, FGR	158	2 5/8	67	2 3/8
	100	2 1/16	42	2 1/8

I—Inner. O—Outer.

FRONT END

MODEL

MODEL	TOE-IN (in inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
FN, FKM, FZM, FCK, FC, FGB, FGR (1938-49)	N 1/4	1 1/2	5	2

N—Negative.

LUBRICATION

MODEL

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI- VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
All models (1938-49)	(S) 80	(W) 30	250	140	250	140	140	140	90

CAPACITIES

MODEL	LUBRICANT CAPACITY				Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	Front Axle Pints	
D1, D1C	8*	16	31	36	
D3, D3S	14*	24	38	60	
D2K	10*	24	38	61	
D2KT2	10*	24	38	61	
D2Z	10*	24	38	61	
D2KT8	10*	24	38	61	
D5	20*	17	38	56	
D5N	20*	17	38	56	
D1T2	8*	16	28	36	
D3T8, D3ST8	14*	24	40	60	
D5T2	20*	17	28	56	
D5T8	20*	17	40	56	

*—Plus 1 qt. per filter.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
All Gasoline Models	152*	19	Pos
All Diesel Models	152**	19	Pos

*—2 Batteries.

**—4 Batteries.

TENSIONS

MODEL	Cylinder Head (pounds feet)	Main Bearings (pounds feet)	Connecting Rod Bearings (pounds feet)
All Models	See Engines, Pages 108-111		

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Intake Exhaust	Make	Type	Size	Gap				
D1, D1C, D1T2	Con T-6427	6-4 1/2 x 4 1/2	40-60	16°B	.....	.022	.017	.017	CH	.....	.025	.....	.....	.....	130
D2K, D2KT2, D2KT8	Wau 140-GK	6-4 1/2 x 5 1/2	40-1500	5°A	.....	.010	.010	.0135	CH	.....	.025	.018	TC	.....	130
D2Z	Wau 140GZ	6-4 1/2 x 5 1/2	40-1500	5°A	.....	.010	.010	.0135	CH	.....	.025	.018	TC	.....	130
D3, D3T8	Con R-6572	6-4 1/2 x 5 1/2	50-60	12°B	.....	.0245	.020	.020	CH	.....	.025	.020	SB	.....	120
D3S, D3ST8	Con R-6802	6-4 1/2 x 5 1/2	50-60	12°B	.....	.0245	.020	.020	CH	.....	.025	.020	SB	.....	120
D5, D5T2, D5T8	Cum HB600	6-4 1/2 x 6	30-50	5°B	.....	.....	.014	.022	.....	Diesel	.....	.....	.....	.....	120
D5N	Cum NHB-600	6-5 1/2 x 6	30-50	20°B	.....	.....	.014	.027	.....	Diesel	.....	.....	.....	.....	120

VALVE SPRINGS

ENGINE MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
Con T-6427	I. 57 O. 129	1.458	12.8 71	1 1/8
Con R6572, R6802	I. 85 O. 165	1 1/4	35 70	2 1/4
Wau 140GK	I. 85 O. 88	1 1/8 2 1/8	26 31	2 1/8 2 1/2
Wau 140GZ	I. 85 O. 88	1 1/8 2 1/8	26 31	2 1/8 2 1/2
Cum HB600	I. 129 O. 143	2 1/8	63 91	2 1/8
Cum NHB600	I. 104 O. 114	1 3/8	74 82	2 1/4

I—Inner. O—Outer.

FRONT END

MODEL	TOE-IN (inches unless otherwise shown)	CAMBER (in degrees)	CASTER (in degrees)	KING PIN SLANT (in degrees)
All Models	1/8 ± 1/16	1/4-1 1/2	1/2-1 1/2	8

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
All Gasoline Models	(S) 40	(W) 20 or 10	140	90	140	90	140	140
All Diesel Models	30 at 80°-100°	20 at 20°-80°	140	90	140	90	140	140

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SERVICE INSTRUCTIONS



WARD LaFRANCE

Series D-1, D-1C, D-2K, D-2Z, D-3, D-3S, D-5

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

PASSENGER CARS

CHEVROLET (All 1949 Models)

DODGE (All 1949 Models)

FORD (All 1949 Models)

NASH (1949 "600")

PLYMOUTH (All 1949 Models)

PONTIAC (1949 6-Cyl. Models)

STUDEBAKER (1949 Champion)

CAPACITIES

MODEL	LUBRICANT CAPACITY				
	Engine Quarts	Trans- mission Pints	Rear Axle Pints	Steering Gear Quarts	System Capacity Quarts
CHEVROLET.....	5½	1½	3½	18	18
DODGE.....	5	2½	3½	18	18
FORD (6 Cyl.).....	5	4	3½	17½	17½
NASH (600).....	5	2½	3½	22	22
PLYMOUTH.....	5	2½	3½	14	14
PONTIAC (6 Cyl.).....	5	1½	3½	18½	18½
STUDEBAKER (Champion).....	5	1½	3½	10	10

*—Includes oil filter.

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
CHEVROLET.....	100	15	Neg
DODGE.....	105	15	Pos
FORD (6 Cyl.).....	100	17	Pos
NASH (600).....	100	17	Pos
PLYMOUTH.....	90	13	Pos
PONTIAC.....	100	15	Pos
STUDEBAKER (Champion).....	100	15	Neg

TENSIONS

ENGINE MODEL	Cylinder Head (pounds feet)	Main Bearings (pounds feet)	Conneg- ing Rod Bearings (pounds- feet)
CHEVROLET.....	75-80	103-109	50-80
DODGE.....	C85-70 N82-57	74-80	53-80
FORD (6 Cyl.).....	50	65-75	50-80
NASH (6 Cyl.).....	50-60	75-80	40
NASH.....	57-60	66-70	27-30
PLYMOUTH.....	C85-70 N82-57	74-80	53-80
PONTIAC.....	60	91-102	42-51
STUDEBAKER (Champion).....	50-54	90	80

C—Cap screws.

N—Nuts.

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Fly- Wheel Teeth B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Clearance for Valve Timing	Exhaust	Make	Type	Size	Gap				
CHEVROLET.....		6-3½x3¾	14 @ 39	1°B		.008	.008	.013	AC	46-5	14mm	.035	.021	5°B	110
DODGE.....		6-3½x4½	45 @ 20	8°B		.014	.008	.010	AL	A-5R	14mm	.038	.020	2°A	118
FORD (6 Cyl.).....		6-3½x4½	57 @ 60	11°B		.015	.010C	.014C	CH	H-10	14mm	.030	.025	TC	110
NASH (600).....		6-3½x3¾	57	TC		.015	.011	.015	CH	H-10	14mm	.030	.015	2°B	106
PLYMOUTH.....		6-3½x3¾	50 @ 30	6°B		.019	.015	.015	AL	A-5	14mm	.030	.021	TC	120°
PONTIAC (6 Cyl.).....		6-3½x4½	45 @ 20	12°B		.014	.008	.010	AL	A-5R	14mm	.038	.023	2°A	101
STUDEBAKER (CHAMPION).....		6-3½x4	35 @ 40	9°B		.012	.012	.012	AC	45	14mm	.025	.020	4°B	101
		6-3x4	40 @ 30	15°B		.020	.015C	.016C	CH	J-7	14mm	.025	.020	2°B	106

*—At 350 RPM.

†—At 1000 RPM.

C—Cold.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
CHEVROLET.....	132	1.505	58	1.821
DODGE.....	111	1.375	45	1.75
FORD (6 Cyl.).....	116	1.75	50	2.13
NASH (600).....	80	1.81	38½	2.13
PLYMOUTH.....	83	1.437	39	1.75
PONTIAC (6 Cyl.).....	111	1.375	45	1.75
STUDEBAKER (Champion).....	101	1.593	68½	1.906
	81	1.437	39	1.656

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
CHEVROLET.....	0-½	½-¾	½-¾	4-½
DODGE.....	0-½	0-½	N1-P1	4½-4
FORD (All Models).....	½-¾	N½-P½	N½-P½	8½
NASH (600).....	0-½	0-½	0-½	8½
PLYMOUTH.....	0-½	0-½	N1-P1	4½-4
PONTIAC (6 Cyl.).....	0-½	0	N½-P1	8
STUDEBAKER (Champion).....	½-¾	½-¾	1½	8½

N—Negative.

P—Positive.

LUBRICATION

MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI- VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
CHEVROLET.....	20 above 32°	20W@10° to 32°	10W@-10° to 10°*	90	90Hyp	90Hyp	A	A	Per Fib
DODGE.....	30 above 32°	20W@10° to 32°	10W@-10° to 10°*	80	90	90	90	90	
FORD (All Models).....	20 above 32°	10W@-10° to 32°	*	80	90	90	140	140	
NASH (600).....	20 above 32°	10W@-10° to 32°	*	90	90Hyp	80Hyp	140EP	140EP	Per
PLYMOUTH.....	30 above 32°	20W@10° to 32°	10W@-10° to 10°*	80	90	90	90	90	Fib
PONTIAC (6 Cyl.).....	20 above 32°	20W above 10°	10W above -10°	90	90	90	B	B	Per
STUDEBAKER.....	30@32° to 90°	20@10° to 32°	10 below 10°	90	90	90			A

*—10% Kerosene below -10°.

Fib—Heavy fiber universal joint grease.

Per—Permanent.

A—Multi-purpose gear lube or chassis lube.

B—All-season steering gear lube.

EP—Extreme pressure lube.

Hyp—Hypoid gear lube.

CAPACITIES

MODEL	LUBRICANT CAPACITY			Cooling System Capacity, Quarts
	Engine Quarts	Transmission Pints	Rear Axle Pints	
WC14.....	12	8	16	32
WC16.....	12	9	22	30
WC16T.....	12	13	22	30
WC18.....	12	13	11	30
WC18B, WC18T, WC20, WC20B, WC20ST, WC20T.....	12	13	11	30
WC22, WC22T, 26, 26T.....	12	16	22	30
WC28, WC28T, WC32.....	12	24	22	38
WC28B.....	12	24	22	30
WC28B4.....	15	24	14	38
WC32B4.....	15	24	26	38
3016.....	10	6	22	28
3018.....	10	11	11	28
3020.....	10	13	11	28

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
WC14, WC16, WC16T, WC18, WC18T, WC20, WC20ST, WC20T, WC22, WC22T, WC26, WC26T, WC28B4, 3016, 3018, 3020.....	119	15	Pos
WC18B, WC20B.....	138	17	Pos
WC28, WC32, WC28B4, WC32B4.....	119*	15	Pos
WC28T.....	138*	17	Pos

*—2 Batteries.

TENSIONS

ENGINE MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
110A, 116A, 120A, 130A, 140A, 150A, 260A, 280A.....	85-90 110	70-75 70-75	40-65 66-120

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tapet Clearance for Valve Timing		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Fly-Wheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake	Exhaust	Intake	Exhaust	Make	Type	Size	Gap				
WC14.....	Own 110A	6-3 1/2 x 4 1/2	35 Max	15°B	.....	0	0	0	0	Ch	J6	14mm	.025	D	7°B	.....	.....
WC16, 3016.....	Own 116A	6-3 1/2 x 4 1/2	35 Max	15°B	.....	0	0	0	0	Ch	J6	14mm	.025	D	7°B	.....	.....
WC16T, WC18, 3018.....	Own 120A	6-3 1/2 x 4 1/2	35 Max	15°B	.....	0	0	0	0	Ch	J6	14mm	.025	D	6°B	.....	.....
WC18T, WC20, WC20B, 3020.....	Own 130A	6-4 x 4 1/2	35 Max	15°B	.....	0	0	0	0	Ch	J6	14mm	.025	D	6°B	.....	.....
WC20T, WC22.....	Own 140A	6-3 1/2 x 5 1/8	35 Max	15°B	.....	0	0	0	0	Ch	J6	14mm	.025	D	7°B	.....	.....
WC20ST, WC22T, WC26, WC26T, WC28B4.....	Own 150A	6-4 x 5 1/8	35 Max	15°B	.....	0	0	0	0	Ch	J6	14mm	.025	D	3°B	.....	.....
WC28.....	Own 260A	6-4 1/2 x 5	45 Max	15°B	.....	0	0	0	0	Ch	6 COM	18mm	.025	E	9°B	.....	.....
WC28T, WC32, WC28B4, WC32B4.....	Own 280A	6-4 1/2 x 5	45 Max	15°B	.....	0	0	0	0	Ch	6 COM	18mm	.025	E	9°B	.....	.....

D—.017 to .018. E—.018 to .024.

VALVE SPRINGS

ENGINE MODEL	VALVE SPRINGS			
	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
110A, 116A, 120A, 130A, 140A, 150A.....	130	1.870	75	2.251
260A, 280A.....	190	1.827	93	2.250

FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
WC14, WC16, WC16T, WC18, WC18B, WC18T, WC20, WC20B, WC20T, WC20ST.....	3/8	1°	2°-50°	8°
WC22, WC22T, WC26, WC26T, WC28, WC28T, WC32, WC22B4, WC28B4, WC32B4.....	3/8	1°	2°-50°	8°30'
3016, 3018, 3020.....	3/8	1°	2°-30°	8°

LUBRICATION

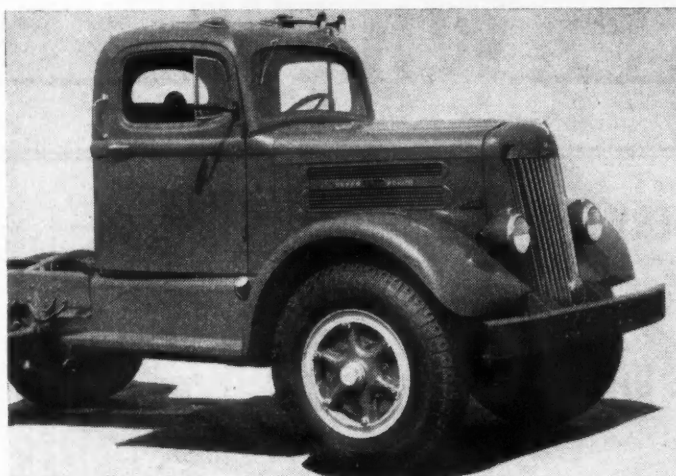
MODEL	ENGINE		TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range		Summer	Winter	Summer	Winter	Summer	Winter	
WC14, WC16, WC16T, WC3016.....	(S)30	(W)20	90	90	140EP	90EP	.....	.....	140
16T, 20, 20B, 20ST, 22, 22T, 26, 26T, 28, 28T, 32, 22B4, 28B4, 32B4, 3016, 3018, 3020.....	(S)30	(W)20	90	90	140	90	.....	.....	140

Note:—EP—Extreme pressure lubricant.

(S)—Summer.

(W)—Winter.

SERVICE SPECIFICATIONS



WHITE

Series WC14, WC16, WC18, WC20, WC22, WC26, WC28, WC32, & Models 3016, 3018, 3020

Note: Specifications are for standard models. If optional engine is used, see data for appropriate engine on this page or under engine manufacturer's listing on pages 108 to 111

SERVICE SPECIFICATIONS

WILLYS

Models CJ-3A, 463, 2WD, 4WD

BATTERY

MODEL	Amp. Hr. Capacity	Number of Plates	Terminal Grounded
All Models.....	100	15	Neg

TENSIONS

MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
All Models.....	60-65	65-70	35-40

TUNE UP

TUNE UP	MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C		Spark Occurs Flywheel Teeth		Comp. Pressure at Cranking Speed
					°C	Flywheel Teeth		Intake	Exhaust	Make	Type	Size	Gap		B-Before	A-After	B-Before	A-After	
All Models.....		Own	4-3½x4½	35-30	9°B	2.4B	.020	.016	.016	AL*	AN-7*	14mm	.030	.020	5°B	1.3B	116		
*—Or Champion J-9.																			

*—Or Champion J-9.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
All Models.....	116	1½	50	2½

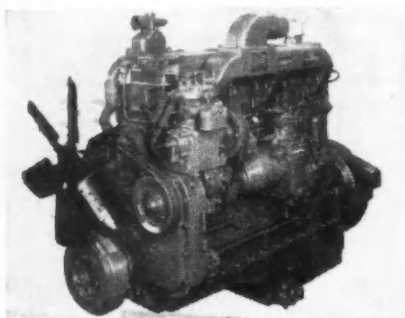
FRONT END

MODEL	TOE-IN (Inches unless otherwise shown)	CAMBER (In degrees)	CASTER (In degrees)	KING PIN SLANT (In degrees)
All 4-Wheel-Drive Models.....	1½	1½	3	7½
463 Panel.....	1½	1½	1	8
2 WD Truck.....	1½	1	4½	7½

LUBRICATION

MODEL	ENGINE			TRANSMISSION		REAR AXLE		STEERING GEAR		UNI-VERSAL JOINT
	Viscosity and Temperature Range			Summer	Winter	Summer	Winter	Summer	Winter	
All Models.....	30 above 90°	20@32° to 90°	20W@10° to 32°*	90A	80A	90B	90B	140	140	C

*—10W at—10° to 10°, 10% kerosene below,—10°
 a—Same for transfer case or overdrive. b—Same for front axles on 4WD models. C—Front axle shaft U-joint; fibre grease or NLG1 #0 winter. NLG1 #1 summer.
 Propeller shaft U-joint: NLG1 #0, winter; NGL1 #1 summer. Rear prop. shaft on 4WD. Lubricated for life.



CUMMINS

4, 6 and 12 Cylinder Series

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
AA-600.....	108-118	2	66-72	2½
HB-400, HB-600, HBS-600, HRB-600, HRBS-600.....	129-143	2½	83-91	2½
NHB-600, NHBS-600, NVH-1200, NVHS-1200.....	104-114	1½	74-82	2½

TENSIONS

MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
AA-600.....	190-210	150-270	40-46
HB-400, HB-600, HBS-600, HRB-600, HRBS-600.....	430-450	310-330	108-116
NHB-600, NHBS-600.....	430-450	310-330	108-116
NVH-1200, NVHS-1200.....	430-450	390-400	138-140

TUNE UP

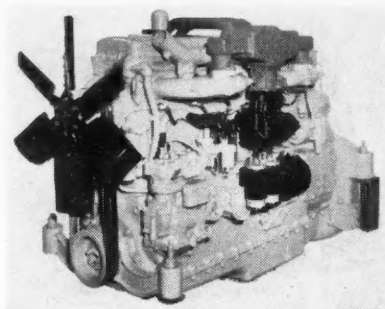
MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve ^a Opens B-Before A-After		Intake Valve Closes B-Before A-After	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Flywheel Teeth °C B-Before A-After	Comp. Pressure at Cranking Speed
				°C	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
AA-600.....		6-4x5		6°B			.015	.025		Diesel						825
HB-400.....		4-4½x6		5°B			.014	.022		Diesel						825
HB-600.....		6-4½x6		5°B			.016	.022		Diesel						825
HBS-600.....		6-4½x6		7°B			.016	.028		Diesel						825
HRB-600.....		6-5½x6		5°B			.016	.022		Diesel						825
HRBS-600.....		6-5½x6		7°B			.016	.028		Diesel						825
NHB-600.....		6-5½x6		20°B			.014	.027		Diesel						825
NHBS-600.....		6-5½x6		7°B			.014	.021		Diesel						825
NVH-1200.....		12-5½x6		20°B			.014	.027		Diesel						825
NVHS-1200.....		12-5½x6		7°B			.014	.027		Diesel						825

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
All Models.....	243	2.000	115	2.485
I—Inner. O—Outer.	243	1.941	115	2.423

TENSIONS

MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
All Models.....	L230-250 S30-40	180-200	130-140
L—Large. S—Small.			



HALL-SCOTT

Models 400, 470, and 480

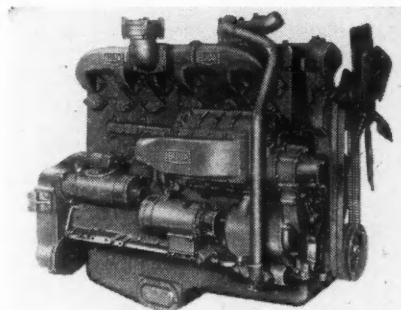
TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Intake Exhaust	Make	Type	Size	Gap				
470.....		8-5 1/4 x 8	55-1600	55°B			.021 .030	CH	Note 1	18mm	A	.018	TC		129
480.....		8-5 1/4 x 8	55-1600	55°B			.021 .030	CH	Note 1	18mm	A	.018	TC		129
400.....		6-5 1/4 x 7	55-1600	55°B			.021 .030	CH	Note 1	18mm	A	.018	TC		129

Note 1—Two per cyl. All exhaust, No. 6. Intake (Butane), No. 8. Intake (Gasoline), No. 9. A—.018-.022.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
K-428 (1936-49).....	125-138	1 1/4	51-57	2 1/4
LO-825 (1938-49).....	128-136	2 1/4	42-49	3 1/4
6MO-779, (1946-49).....	145-155	2 1/4	62-68	2 3/4
6MO-893, 6MO-970 (1946-49).....	145-155	2 1/4	62-68	2 3/4
6BD-273 (1946-49).....	105-115	1 1/4	40-50	1 3/4
6DT-317 (1938-49).....	84-89	1 1/4	35-40	2
6DT-468 (1938-49).....	78-86	1 1/4	35-38	2 1/4
6DC-844 (1944-49).....	144-155	2 1/4	62-68	2 3/4
6DCS-844 (1945-49).....	144-155	2 1/4	62-68	2 3/4
6DC-1125, 6DCS-1125 (1945-49).....	162-172	2 1/4	70-80	2 3/4

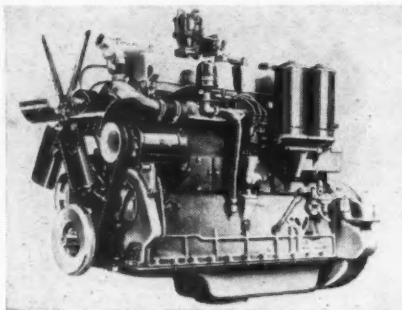


TENSIONS

MODEL	Cylinder Head (pounds-foot)	Main Bearings (pounds-foot)	Connecting Rod Bearings (pounds-foot)
All Models.....	5/8"- 80-70 3/4"- 75-85 7/8"- 95-105 1"- 125-135 1 1/8"- 150-160	1 1/4"- 195-200 1 1/2"- 210-230 1 3/4"- 230-250 1 7/8"- 245-275 2"- 285-315 2 1/4"- 325-350	

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °TC B-Before A-After	Spark Occurs Flywheel Teeth °TC B-Before A-After	Comp. Pressure at Cranking Speed
				°TC	Flywheel Teeth TC	Intake Tappet Clearance for Valve Timing	Intake Exhaust	Make	Type	Size	Gap				
6B-230.....		6-3 1/4 x 4 1/2	35-1600	10°B		.008 .009	.009	CH		14mm	.030	.018			
6B-273.....		6-3 1/4 x 4 1/2	35-1600	10°B		.008 .009	.009	CH		14mm	.030	.018			
HP328.....		6-3 1/4 x 4 1/2	40-1400	TC		.008 .008	.009	CH	15A	18mm	.030	.018			103
HP351.....		6-3 1/4 x 5 1/2	40-1400	TC		.006 .006	.009	CH	15A	18mm	.030	.018			103
K428.....		6-4 1/4 x 4 1/2	40-1400	TC		.006 .006	.009	CH	15A	18mm	.025	.018			102
L325.....		6-4 1/4 x 5 1/2	40-1600	TC		.006 .006	.009	CH	15A	18mm	.025	.018			87
L325.....		6-4 1/4 x 5 1/2	40-1500	10°B		.009 .009	.018	CH	J10	18mm	.025	.018			93
6MO-779.....		6-5 1/4 x 8	35-1800	20°B		.015 .015	.015	CH	6COM	18mm	.027	.018			128
6MO-893.....		6-5 1/4 x 8	30-1200	10°B		.010 .015	.015	CH	6COM	18mm	.027	.018			105
6MO-970.....		6-5 1/4 x 8	35-1800	20°B		.015 .015	.015	CH	6COM	18mm	.027	.018			125
6BD-230.....		6-3 1/4 x 4 1/2	35-1600	20°B		.008 .009	.009	Die sel							390
6BD-273.....		6-3 1/4 x 4 1/2	20-1800	20°B		.008 .009	.009	Die sel							390
6DT-317.....		6-3 1/4 x 5 1/2	40-1600	12°B		.009 .009	.012	Die sel							
6DT-468.....		6-4 1/4 x 5 1/2	35-1600	12°B		.009 .009	.012	Die sel							
6DC-844.....		6-5 1/4 x 8	30-1200	20°B		.010 .015	.015	Die sel	Die sel						390
6DCS-844.....		6-5 1/4 x 8	30-1200	45°B		.010 .015	.015	Die sel							
6DCS-1125.....		8-5 1/4 x 8 1/2	30-1200	45°B		.010 .015	.015	Die sel							
6DC-1125.....		8-5 1/4 x 8 1/2	30-1200	20°B		.010 .015	.015	Die sel							



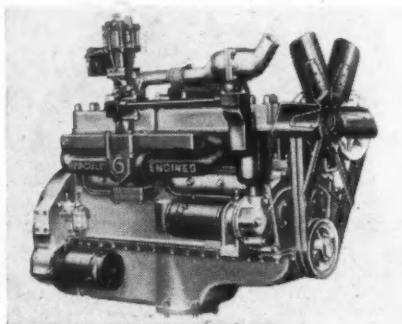
CONTINENTAL

Series F, M, B, T, R, U, S, TD, RD

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Flywheel Teeth B-Before A-After	Connecting Rod Bearings at Cranking Speed
				°TC	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
F6186		6-3x4 1/2	35-40	TC		.014	.014	.014A			18mm	.025				118
F6209		6-3 1/2 x4 1/2	35-40	TC		.014	.014	.014A			18mm	.025				118
F6226		6-3 1/2 x4 1/2	30-40	TC		.014	.014	.014A			18mm	.025				118
M6271		6-3 1/2 x4 1/2	40-50	6 1/2" B		.0175	.017	.020B			18mm	.025				118
M6290		6-3 1/2 x4 1/2	40-50	6 1/2" B		.0175	.017	.020B			18mm	.025				118
M6330		6-4x4 1/2	40-50	6 1/2" B		.0175	.017	.020B			18mm	.025				118
S6371		6-4 1/2 x4 1/2	40-50	6 1/2" B		.022	.017	.022D			18mm	.025				118
T6371		6-4 1/2 x4 1/2	40-50	16" B		.022	.017	.017			18mm	.025				118
B6427		6-4 1/2 x4 1/2	40-50	6 1/2" B		.022	.018	.018			18mm	.025				118
T6427		6-4 1/2 x4 1/2	40-50	16" B		.022	.017	.017			18mm	.025				118
U6501		6-4 1/2 x5 1/2	40-50	17" B		.0225	.020	.020			18mm	.025				120
R6513		6-4 1/2 x5 1/2	50-60	12" B		.0245	.020	.020			18mm	.025				120
R6572		6-4 1/2 x5 1/2	50-60	12" B		.0245	.020	.020			18mm	.025				120
R6602		6-4 1/2 x5 1/2	50-60	12" B		.0245	.020	.020			18mm	.025				120
S6749		6-5 1/2 x5 1/2	40-60	17" B				.020			18mm	.025				120
TD6427		6-4 1/2 x4 1/2	40-60	12" B							Die sel					
RD6572		6-5 1/2 x5 1/2	40-60	12" B							Die sel					

A—With Roto Valve, .010; B—With Roto Valve, .016; D—With Roto Valve, .018.



HERCULES

Series ZX, IX, QX, JX, WX, YX, RX, HX and Diesels

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
B6371, B6427	O. 102-110	1.521	53-59	1 1/4
	I. 28-32	1 1/4	11.3-14.3	1 1/4
F6186, F6226	101	1 1/4	42.5-47.5	1 1/4
F6186, F6209	98-104	1 1/4	42.5-47.5	1 1/4
M6271, M6290, M6330	111-118	1.521	53-59	1 1/4
R6513, R6572, R6602, RD6572	O. 180-170	1 1/4	67-73	2 1/4
	I. 82-88	1 1/4	33-37	2 1/4
T6371, T6427, TD6427	O. 129	1.458	71	1 1/4
	I. 57	1 1/4	12.8	1 1/4
S6749	O. 200	2 1/4	90	2 1/4
	I. 100	2 1/4	45	2 1/4

I—Inner. O—Outer.

TENSIONS

MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
All Models	1 1/2" (18) 20-25* 1 1/4" (16) 35-40* 1" (20) 70-75*	1 1/2" (20) 85-95* 1 1/4" (18) 120-130* 1" (18) 135-145*	

*—Alloy steel.

TENSIONS

MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
ZX Series	35	77	25
IX Series	33	77	42
JX Series	75	*60	52
		*70	
QX Series	80	*60	39
		*70	
WX Series	60	*70	105
		*105	153
YX, RX Series	75	*105	105
		*123	115
RXL Series	80	175	158
			123
HX Series	105	*193	263
		*210	
D1X6	158	105a	95
		85b	
DOO Series	158	*77	140
		*95	
DWX Series	158	175	158
DJX Series	158	*77	140
		*95	
DRX Series	5 1/4"-175	175	158
	1"-280		
DFX Series	300	260	263

*—Center and rear.
††—Connecting rod 1/8 in.
†—Connecting rod 1/4 in.
**—Front and intermediate.
†—Babbitt.
a—Front, center and rear.
b—Intermediate.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
ZX Series	35	1 1/4	22	1 1/4
IX Series	42	1 1/4	21	1 1/4
OO, JX Series	58	1.594	43	1.920
QX Series	37-41	1 1/4	17-19	1 1/4
OX, WX, WXL, YX, RX, RXL Series	102	2 1/4	50	2 1/4
HX Series	O. 84	3 3/4	47	3 3/4
	I. 45	2 1/4	27	3 3/4
D1X6D	O. 49	1.2125	26	1.5825
	I. 34	1.0875	16	1.4375
DOO, DJX Series	O. 55	1.406	31	1.781
	I. 37	1.281	19	1.656
DWX Series	O. 73	1 1/4	34	1 1/4
	I. 64	1 1/4	25	1 1/4
DRX Series	O. 48	1.449	27	1.844
	I. 30	1.355	17	1.750
DFX Series (Except DFXH)	O. 94	2 1/4	55	3 1/4
	I. 57	2 1/4	32	3 1/4
DFXH	O. 124	1 1/4	63	2 1/4
	I. 96	1 1/4	42	2 1/4

I—Inner. O—Outer.

HERCULES—continued

SERVICE SPECIFICATIONS

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Fly-Wheel Teeth °C B-Before A-After	Comp. Pressure at Cranking Speed
				°C	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
IX Series			15-1000	5°A	Var	.006	.006	.006		Opt		.025	.020	N	N	Opt
IX Series			15-1000	5°A	Var	.006	.006	.008		Opt		.025	.020	N	N	Opt
QXA, QXB, QXC, QXD			26-1600	5°B	Var	.006	.006	.008		Opt		.025	.020	N	N	Opt
QXLD		6-3 1/2 x 4 1/4	26-1600	5°B	Var	.006	.008	.010		Opt		.025	.020	N	N	Opt
JXA, JXF, JXG, JXE3, JXB, JXG, JXD			26-1600	5°A	Var	.010	.008	.010		Opt		.025	.020	N	N	Opt
JXLD		6-4 x 4 1/2	35-1600	5°B	Var	.010	.010	.010		Opt		.025	.020	N	N	Opt
WX Series			26-1600	2°A	Var	.010	.006	.010		Opt		.025	.020	N	N	Opt
RXB		6-4 1/2 x 5 1/4	26-1600	2°A	Var	.010	.010	.016		Opt		.025	.020	N	N	Opt
RXC		6-4 1/2 x 5 1/4	36-1600	2°A	Var	.010	.010	.016		Opt		.025	.020	N	N	Opt
RXLC		6-4 1/2 x 5 1/4	36-1600	2°A	Var	.010	.010	.016		Opt		.025	.020	N	N	Opt
RXLD		6-4 1/2 x 5 1/4	36-1600	2°A	Var	.010	.010	.016		Opt		.025	.020	N	N	Opt
HXB		6-5 x 5	36-1600	5°B	Var	.015	.010	.016		Opt		.025	.020	N	N	Opt
HXC		6-5 1/2 x 6	35-1600	5°B	Var	.015	.010	.016		Opt		.025	.020	N	N	Opt
HXD		6-5 1/2 x 6	35-1600	5°B	Var	.015	.010	.016		Opt		.025	.020	N	N	Opt
HXE		6-5 1/2 x 6	35-1600	5°B	Var	.015	.010	.016		Opt		.025	.020	N	N	Opt
DJXB		6-3 1/2 x 4 1/2	45-2000	12°B	Var	.010	.010	.010		Die sel						Opt
DJXB		6-3 1/2 x 4 1/2	45-2000	17 1/2°B	Var	.010	.010	.010		Die sel						Opt
DJXC		6-3 1/2 x 4 1/2	45-2000	12°B	Var	.010	.010	.010		Die sel						Opt
DOOB		4-3 1/2 x 4 1/2	30-1200	12°B	Var	.010	.010	.010		Die sel						Opt
DOOC		4-4 x 4 1/2	30-1200	12°B	Var	.010	.010	.010		Die sel						Opt
DOOD		4-4 x 4 1/2	30-1200	12°B	Var	.010	.010	.010		Die sel						Opt
DWXD		6-4 1/2 x 4 1/2	40-1600	17 1/2°B	Var	.010	.010	.010		Die sel						Opt
DRXB		6-4 1/2 x 5 1/4	30-1200	12°B	Var	.016	.016	.016		Die sel						Opt
DRXC		6-4 1/2 x 5 1/4	30-1200	12°B	Var	.016	.016	.016		Die sel						Opt
DFXB		6-5 x 6	50-1200	5°B	Var	.015	.010	.016		Die sel						Opt
DFXC		6-5 1/2 x 6	50-1200	5°B	Var	.015	.010	.016		Die sel						Opt
DFXD		6-5 1/2 x 6	50-1200	5°B	Var	.015	.010	.016		Die sel						Opt
DFXE		6-5 1/2 x 6	50-1200	5°B	Var	.015	.010	.016		Die sel						Opt
DFXH		6-5 1/2 x 6	50-1200	5°B	Var	.015	.010	.016		Die sel						Opt

N—Varies with compression ratio.

VALVE SPRINGS

MODEL	Valve Open		Valve Closed	
	Pressure (Ave.) Pounds	Length Inches	Pressure (Ave.) Pounds	Length Inches
190GL	71	1 1/8	48	1 1/8
6BZ	110	1 1/4	61	2 1/8
6MZA	101	1 1/4	64	2 1/8
140GK	86	1 1/4	31	2 1/8
	55	1 1/4	26	1 1/8
140GKB, 140GZB (Hi Output)	127	1 1/4	67	2 1/8
	70	1 1/4	30	1 1/8
6SRKR	101	2 1/8	68	2 1/8
145GK, 145GZ	118	2 1/8	48	2 1/8
	81	2 1/8	32	2 1/8
145GKB (Hi Output)	158	2 1/8	67	2 1/8
	100	2 1/8	42	2 1/8
190DLB	71 ± 6	1 1/8	48 ± 4	1 1/8
148DK	118 ± 9	2 1/8	48 ± 4	2 1/8
	81 ± 6	2 1/8	32 ± 3	2 1/8
6WAKD	140 ± 10	2 1/8	50 ± 3	3 1/8
	139 ± 11	2 1/8	56 ± 4	3 1/8

I—Inner. O—Outer.

TENSIONS

MODEL	Cylinder Head (pounds-feet)	Main Bearings (pounds-feet)	Connecting Rod Bearings (pounds-feet)
190GL	81-83	109-113	48
6BZ	73-75	88-92	67-69
6MZA	73-75	96-100	67-69
140GK, 140GKB, 140GZB	129-133	129-133	121-125
6SRKR	73-75	129-133	121-125
145GK, 145GKB, 145GZ	L200	242-250	73-75
	S175		
6WAK, 6WAKH	146-150	242-250	86-88
190DLB	96-100	108-112	45-50
148DK	L240-250	240-250	65-69
	S170-190		
6WAKD	L240-250	240-250	90-95
	S170-190		

L—Long.

S—Short.

TUNE UP

MODEL	Standard Engine Make and Model	Number of Cylinders, Bore and Stroke	Normal Oil Pressure Lb. at M.P.H. or R.P.M.	Intake Valve Opens B-Before A-After		Intake Tappet Clearance for Valve Timing	OPERATING TAPPET CLEARANCE (Hot unless noted)		SPARK PLUG				Breaker Point Gap	Spark Occurs °C B-Before A-After	Spark Occurs Fly-Wheel Teeth °C B-Before A-After	Comp. Pressure at Cranking Speed
				°C	Flywheel Teeth TC		Intake	Exhaust	Make	Type	Size	Gap				
190GL		6-3 1/2 x 4	12-15*	8°B	3B	.010	.010-12C	.014-16C	Opt		18mm	.025	.018	Var	Var	
6BZ		6-4 x 4 1/4	40-1500	8°B	3B	.008	.008-10C	.018-21C	Opt		18mm	.025	.010	Var	Var	112
6MZA		6-4 1/2 x 5 1/4	40-1500	15°B	5B		.012-14C	.018-20C	Opt		14 or 18	.025	.018	Var	Var	110
140GK (Hi Output)		6-4 1/2 x 5 1/4	40*	15°B	5B		.012-14C	.024-26C	Opt		14 or 18	.025	.018	Var	Var	
6SRKR		6-4 1/2 x 5 1/4	40*	8°A	3A	.004	.008-10C	.024-26C	Opt		14 or 18	.025	.018	Var	Var	90
140GZB (Hi Output)		6-4 1/2 x 5 1/4	40*	15°B	5B		.012-14C	.024-26C	Opt		14 or 18	.025	.018	Var	Var	
145GK, 145GKB (Hi Output)		6-5 1/2 x 6	40*	15°B	6B		.012-14C	.023-25C	Opt		14 or 18	.025	.018	Var	Var	
145GZ		6-5 1/2 x 6	40*	15°B	6B		.015-17C	.021-23C	Opt		14 or 18	.025	.018	Var	Var	
6WAK, 6WAKH		6-6 1/2 x 5 1/4	40-1500	TC	TC	.012	.018-20C	.025-27C	Opt		18mm	.025	.018	Var		85†
190DLB		6-3 1/2 x 4	15-1500	8°B	3B	.010	.009-11C	.015-17C			Die sel					
148DK		6-5 1/2 x 6	40-1500	10°B	TC		.014-16C	.022-24C			Die sel					
6WAKD		6-6 1/2 x 5 1/4	40-1300	TC	TC	.012	.013-15C	.023-25C			Die sel					450

*—At governed speeds.

C—Cold.

†6WAKH, 125 lb.

Want to Go to School? ..



Factory Field Service Help and Maintenance Literature Available to Fleets

Name of Company	Where to Write to Have Field Service Representative Assigned to Fleet for Maintenance Assistance	Maintenance Manuals or Service Bulletins Available to Fleets	To Procure Maintenance Manuals or Bulletins, Write to	Name of Company	Where to Write to Have Field Service Representative Assigned to Fleet for Maintenance Assistance	Maintenance Manuals or Service Bulletins Available to Fleets	To Procure Maintenance Manuals or Bulletins, Write to
AC Spark Plug Div., GMC Flint, Mich.	Earl McGinnis Sales Promotion Mgr. Sales Department	Instruction manuals	Company	Electric Storage Battery Co. Phila. 32, Pa.	Branch Mgrs.	Battery maintenance booklets	Branch Offices
Allen Electric & Equipment Co. Kalamazoo, Mich.	F. A. Colasimo Ch. Ser. Eng.	Instruction manuals	Company	F. A. B. Mfg. Co. Oakland 8, Cal.	V. A. Stout	Instruction manuals	Company
American Brakeblok Div. American Brake Shoe Co. Detroit 9, Mich.	C. W. Smith Asst. Sales Mgr. P. L. Chastain Sales Mgr. Main Office	Special literature Brake service manual	Company	Four Wheel Drive Auto Co. Clintonville, Wis.	Service Department	Maintenance manuals & service bulletins	Company
American Grease Stick Co. Muskegon, Mich.	Walter V. Hall Sales Mgr.	Instruction manuals	Advertising Manager	Fram Corp. Providence 16, R. I.	District Sales Mgrs.	Maintenance instruction manuals	Company
Barrett Equipment Co. St. Louis 6, Mo.	E. Wenzel, Product Mgr. Stromberg Carburetors	Instruction manuals	Company	Fruehauf Trailer Co. Avon Lake, O.	H. J. Biers	Maintenance manuals	Branch Offices (Sales)
John Bean Mfg. Co. Lansing, Mich.	L. A. Santry, Prod. Mgr. Vacuum Power Brakes	Instruction manuals	Company	Fuller Mfg. Co. Kalamazoo, Mich.	L. C. Butler Mgr. Serv. Sales B. S. Tooker, Serv. Mgr. Company	Instruction manuals	Company
Bear Mfg. Co. Rock Island, Ill.	B-W Distributor	Films and manuals	Company	Gate Rubber Co. Denver, Colo.	P. W. Wolf Adv. Mgr.	Charts & instruction material	Company
Bendix Products Div. Bendix Aviation Corp. South Bend 20, Ind.	Branch Managers	Tool handbooks	Company	General Detroit Corp. Detroit 32, Mich.	Tech. Service Mgr.	Instruction manuals	Company
Bendix-Weightinghouse Air Brake Co., Elyria, Ohio	Manager, Distributor Sales	Instruction manuals	Branch Managers	GMC Truck & Coach Div. GM Pontiac, Mich.	Company	Instruction manuals	Company
Black & Decker Mfg. Co. Towson, Md.	Branch Managers	Instruction manuals	Company	Gray-Rock Div. Raybestos-Manhattan Inc. Manheim, Pa.	Frank Dayes Tech. Serv. Mgr.	Instruction manuals	Company
Blackhawk Mfg. Co. Milwaukee, Wis.	Company	Instruction manuals	Company	Hall-Scott Motor Div. ACF-Brill Motors Co. Phila. 42, Pa.	C. N. Bouman Sales Mgr. Bob G. Lift Serv. Sales Mgr. C. E. Johnson	Instruction manuals	Company
Brockway Motor Co., Inc. Cortland, N. Y.	Company	Instruction manuals	Company	Holland Hitch Co. Holland, Mich.	Branch and District Managers	Bulletins & IHC Serv. information	Company
Buda Co. Harvey, Ill.	Company	Instruction manuals	Company	Holley Carburetor Co. Detroit 4, Mich.	W. C. Watson	Instruction manuals	Company
Champion Spark Plug Co. Toledo 1, O.	M. B. Cooper	No	Company	Hoof Products Co. Chicago 38, Ill.	E. H. Harre	Instruction manuals	Company
Clawson & Bais, Inc. Chicago 16, Ill.	Jack P. Pedersen Sales Mgr. W. J. Scanlan	Instruction manuals	Company	International Harvester Co. Chicago, Ill.	Lee Doty, Mgr. Fleet Sales & Serv.	Instruction manuals	Lee Doty
Crosley Motors, Inc. Cincinnati 14, O.	L. S. Mann Sales Mgr. I. F. Graham V. Pres.	Instruction manuals	Company	Kelite Products, Inc. Los Angeles 12, Cal.	Robert Gray Tech. Serv. Engr. A. B. Harding, Sales Mgr. A. B. Rowe Prom. Sales Mgr.	Instruction manuals	Company
Curran Corp. Lawrence, Mass.	H. M. Kidd & E. F. Frey	Instruction manuals	Company	Kerkling & Co. Burbank, Cal.	W. R. Persons Gen. Sales Mgr.	Instruction manuals	Company
Davison Chemical Corp. Baltimore 3, Md.	Sidney G. Harris Mgr., Auto. Div. R. H. Gale Axle Div.	Cooling syst. manuals	Company	Koppers Co., Inc. Piston Ring Dept. Baltimore 3, Md.			
Detroit Automotive Prod. Corp. Detroit 13, Mich.	A. A. Manchester Auto. Div. No. 2 Education Dept.	Instruction manuals	Company	Leeco-Neville Co. Cleveland 14, O.			
DeVilbiss Co. Toledo 1, O.	A. I. Snyder Sales Mgr. E. J. Formhals	Battery catalog	Branch Serv. Mgr.	Lempco Products, Inc. Bedford, O.			
E. F. Drew & Co., Inc. New York 10, N. Y.		Instruction manuals	Company	Lincoln Electric Co. Cleveland 1, O.			
Eaton Mfg. Co. Cleveland 10, O.		No	Company				
Thomas A. Edison, Inc. West Orange, N. J.							
Electric Auto-Lite Co. Toledo 1, O.							
Electric Heat Control Co. Cleveland 5, O.							
Electric Sprayit Co. Sheboygan, Wis.							

A survey of truck, trailer, parts and accessory manufacturers reveals valuable technical assistance and training facilities available to fleets

Name of Company	Where to Write to Have Field Service Representative Assigned to Fleet for Maintenance Assistance	Maintenance Manuals or Service Bulletins Available to Fleets	To Procure Maintenance Manuals or Bulletins, Write to	Name of Company	Where to Write to Have Field Service Representative Assigned to Fleet for Maintenance Assistance	Maintenance Manuals or Service Bulletins Available to Fleets	To Procure Maintenance Manuals or Bulletins, Write to
Lincoln Engineering Co. St. Louis 20, Mo.	Joseph J. Jenkins Serv. Mgr.	Instruction & service bulletins	Company	Sun Electric Corp. Chicago 31, Ill.	Branch Sales Mgr.	Instruction manuals	Company
Lipe-Rollway Corp. Syracuse 1, N. Y.	J. H. Williams Asst. Serv. Mgr.	Instruction manuals	Company	Texas Co. New York 17, N. Y.	Main Office	"Lubrication" magazine	Company
Little Giant Products, Inc. Peoria 3, Ill.	Russell Campbell	No		Thermoid Co. Trenton 6, N. J.	Division Manager	ATA manuals & catalogs	Company
Mack Manufacturing Corp. Long Island City 1, N. Y.	Serv. Engineering Dept.	Maintenance instruction manuals	Company or Branch	Thompson Products, Inc. Cleveland 3, O.	Phil Sommerlad Gen. Sales Mgr.	Thompson technical library	Company
Magnus Chemical Co., Inc. Garwood, N. J.		Maintenance manuals	Local Serv. Representative	Timken Roller Bearing Co. Canton 6, O.	Norman Hoertz Chief Engr.	Instruction manuals	Company
Marmon-Herrington Co., Inc. Indianapolis 7, Ind.	H. B. Blank Service Manager	Instruction manuals	Company	Toledo Steel Products Co. Toledo, O.	H. K. Lang Sales Mgr.	Service bulletins	Company
McCreary Tire & Rubber Co. Indiana, Pa.	R. H. Kelly	Instruction manuals	Company	Trailmobile Co. Cincinnati 9, O.	E. W. Stock Service Mgr.		
Mid-Continent Petroleum Corp. Tulsa, Okla. (Midwest Sect.)	C. F. Niessen Asst. Sales Prom. Mgr.	Maintenance manuals	Company	Truck Equipment Co., Inc. Buffalo 14, N. Y.	H. H. Weber Vice Pres.	Service manuals	Company
Milwaukee Electric Tool Corp. Milwaukee 8, Wis.	R. L. Siebert	Instruction manuals	Company	Truckstall Co. Cleveland 14, O.	J. J. O'Neill Sales Mgr.	Instruction manuals	Distributors
Minnesota Automotive, Inc. Minneapolis 3, Minn.	G. J. McGrath Sales Manager	Brake manual	Company	United States Rubber Co. Detroit 7, Mich.	J. G. Berry	Technical data & maintenance manuals	Company
Monmouth Products Co. Cleveland 6, O.	E. H. Conway Sales Promotion Mgr.	Clutch serv. manual & bulletins	Company	United Motors Service Detroit, Mich.	C. E. Reinhardt Gen. Service Mgr.	Maintenance handbooks	Company
Moog Industries, Inc. St. Louis 14, Mo.	Main Office	Service manuals	Company	Utility Trailer Mfg. Co. Los Angeles 54, Cal.	Gen. Service Mgr.	Instruction manuals	Distributor
Ohio Piston Co. Cleveland, O.	Dan P. Shaw	Instruction manuals	Company	Van Dorn Electric Tool Co. Towson 4, Md.	Branch Mgrs.	Tool handbooks	Company
Palm Brothers Decalcomania Co. Cincinnati 12, O.	Grover E. Schultz Sales Serv. Mgr.	No		Van Norman Co. Springfield 7, Mass.	Leo Lennon	Instruction manuals	Company
Pennsylvania Rubber Co. Jennette, Pa.	Branch Office Mgrs.	Instruction manuals	Branch Office	Wagner Electric Corp. St. Louis 14, Mo.	Company	Brake maintenance manuals	Company
Perfect Circle Corp. Hagerstown, Ind.	A. J. Weigand	Various serv. manuals & catalogs	Company	Walter Motor Truck Co. Ridgewood, Queens, N. Y.	Herman P. Offenlock Serv. Mgr.	Instruction manuals	Company
Prest-O-Lite Battery Co., Inc. Toledo 1, O.	Sales Department	Instruction manuals	Company	Warner Electric Brake Mfg. Co. Beloit, Wis.	H. L. Fleming	Instruction manuals	Company
Pyrene Mfg. Co. Newark 8, N. J.	District Managers	Maintenance instruction manuals	Company	Waterbury Tool Div. Vickers, Inc.	H. G. Gros, Mgr. Industrial Sales	Operating instruction manuals	Company
Ramsey Corp. St. Louis, Mo.	J. M. Miller	Instruction manuals	Company	Waterbury, Conn.			
Raybestos Div. Raybestos-Manhattan, Inc.	Frank Crook	Brake serv. guide	Company	Wausau Motor Parts Co. Wausau, Wis.	S. W. Budil Chief Replacement Engr.	Instruction manuals	Company
Reo Motors, Inc. Lansing, Mich.	Service Manager	Instruction manuals	Company	Weaver Mfg. Co. Springfield, Ill.	E. C. Henning	Operating instruction manuals	Company
Sealed Power Corp. Muskegon, Mich.	F. I. Edwards	Oil & gas. economy manual	Company	Joseph Weidenhoff, Inc. Chicago 10, Ill.	R. E. Lee Asst. Gen. Sales Mgr.	Instruction manuals	Company
Spicer Mfg. Div., Dana Corp. Toledo 1, O.	Thru vehicle makers	See vehicle manufacturer's manual	Vehicle maker	White Motor Co. Cleveland 1, O.	Branch Managers	Maintenance manuals	Branch manager
Standard Oil Co. of Cal. San Francisco 20, Cal.	R. W. Goodall	No		Wilkens Mfg. Co. Philadelphia 42, Pa.	S. S. Evans Sales Mgr.	Engine repair manual	Company
The Studebaker Corp. South Bend 27, Ind.	W. J. Moeller Truck Service Mgr.	Shop manuals	Company	Wolf's Head Oil Ref. Co., Inc. Oil City, Pa.	C. R. Scott	No	
				World Sbestos Corp. New Castle, Ind.	W. F. Rogge Mgr. Replacement Sales	No	

Training Schools Available to Fleet Shop Personnel

Name of Company	Type of Training School Available to Fleet Personnel	Length of Course	Tuition	To Arrange for Attendance, Write to
Allen Electric & Equipment Co., Kalamazoo, Mich.	Electric tune-up	1 week	None	Earl Wight, Registrar
Barrett Equipment Co., St. Louis 6, Mo.	Specialized brake service	2 weeks	\$15.00	Barrett Brake School
Beir Mfg. Co., Rock Island, Ill.	Alignment, balancing, frame straightening	2-4 wks.	\$12.50	Wm. O. Merritt, Dir. & Registrar
Bendix-Westinghouse Air Brake Co., Eljria, O.	Air brakes	1 week	None	C. A. Jarosz, Supervisor of Instruction
The Buda Co., Harvey, Ill.	Engine overhaul	1 week	None	L. F. Shoemaker
Crosley Motors, Inc., Cincinnati, O.	Servicing engine and car	3 days	None	J. P. Pedersen, Com. Sales Mgr.
Detroit Automotive Products Corp., Detroit 13, Mich.	3rd axle and Thornton drives	Varies	None	I. F. Graham, Vice Pres.
DeVilbiss Co., Toledo 1, O.	Spray equipment—use, care and maintenance	1 week	None	Factory
Electric Auto-Lite Co., Toledo 1, O.	Servicing accessories	4 weeks	None	H. B. Hewitt, Dir. of Education
Ford Motor Co.	Service, repairs and maintenance	Varies	None	Serv. Mgr., District offices
Four Wheel Drive Auto Co., Clintonville, Wis.	Vehicle overhaul	1 or 2 wks.	None	Service Division
GMC Truck & Coach Div., GM, Pontiac, Mich.	Diesel engine	10 days	\$70.00	Technical Service Manager
Hall-Scott Div., ACF-Brill Motors Co., Phila. 42, Pa.	Maintenance and operation	Varies	None	F. Dayes, Tech. Service Mgr.
International Harvester Co., Chicago, Ill.	Vehicle maintenance	Series of meetings	None	S. E. Houston, Super. Advertising, Motor Truck
Lincoln Electric Co., Cleveland, O.	Practical arc welding	4-5 weeks	\$15.00(j)	J. R. Morrill, Asst. to V. P.
Lincoln Engineering Co., St. Louis 20, Mo.	Repair, maintenance and application	Varies	None	Service Manager
Mack Mfg. Corp., Long Island City, N. Y.	Maintenance and overhaul	3-4 days	None	Division Manager
Perfect Circle Corp., Hagerstown, Ind.	Piston ring installation	3 days	None	A. J. Weigand
Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn.	General brake service	1-2 wks.	None	Frank Crook
Reo Motors, Inc., Lansing 20, Mich.	Reo truck operation	Varies	None	Service Manager
Sun Electric Corp., Chicago 31, Ill.	Electric and engine tune-up	3-4 wks.	(i)	Director of Education
United Motors Service, Div. of GMC, Detroit 2, Mich.	Automotive electricity	2-3 wks.	None	C. E. Reinhardt, Gen. Service Mgr.
Van Norman Co., Springfield 7, Mass.	Crankshaft grinding	3 days	None	Leo Lennon
Warner Electric Brake Mfg. Co., Beloit, Wis.	Brake service	1 day	None	H. L. Fleming
Weaver Mfg. Co., Springfield, Ill.	Wheel alignment	Varies	None	E. C. Henning
Joseph Weidenhoff, Inc., Chicago 10, Ill.	Electrical tune up	4-8 wks.	None	R. E. Lee, Asst. General Sales Mgr.
Wolf's Head Oil Ref. Co., Inc., Oil City, Pa.	Lubrication problems	2 days	None	C. R. Scott

(i) Not established at time of compilation.

(j) basic course



COMPONENT

A Compilation of Standard Model Data

• KEY TO ABBREVIATIONS AND REFERENCES •

- FOOTNOTES**
- (1) Shuler and Eaton
 - (2) Timken and Eaton
 - (3) Shuler and Timken or Eaton
 - (4) Shuler and Timken
 - (5) Integral with carburetor
 - (6) Loadmaster engine available as optional equipment
 - (7) Delco-Remy distributor, Bosch magneto, on off-highway units; others, Delco-Remy
 - (8) Delco-Remy starter, Electric Auto-Lite generator
 - (9) Auto-Lite generator, Leece-Neville starter
 - (10) Ensign KGNL or Zenith 63-AW-16
 - (11) DeLuxe and Cune
 - (12) Any of these engines optional on any model
 - (13) Continental, Hercules, Hall-Scott and Buda engines available in certain Sterling chassis

MAKES OF UNITS

A-B—American Bosch Corp.
AL—Electric Auto-Lite Co.
AM—Air Mase Corp.
AmC—American Chain & Cable Co.

AOS—A. O. Smith Co.
Aub—Auburn Clutch Company
A-W—Auto-Lite or Willard
B&B—Borg & Beck Div.
BD—Budd or Dayton
B-D-M—Budd, Dayton or Motor Wheel
Bdd—Budd Wheel Company
Ben—Bendix Products Div.
B-K—Budd or Kelsey Hayes
Bla—Blackstone Corp.
Bld—Blood Bros. Machine Co.
B-L—Brown Lipe (Spicer Mfg. Div.)
B-M—Budd or Motor Wheel
Bos—American Bosch Corp.
Bud—Buda Co.
Car—Carter Carburetor Corp.
C-B—Clark or Budd
Cla—Clark Equipment Co.
Con—Continental Motors Corp.
CS—Cleveland Steel Products Co.
Cum—Cummins Engine Co.
Day—Dayton Steel Foundry Co.
DD—Detroit Diesel
DeL—DeLuxe Products Corp.
Det—Detroit Steel Products Co.
Don—Donaldson Co.
D-M—Dayton or Motor Wheel
D-R—Delco-Remy Div.
Eat—Eaton Mfg. Co.
Ens—Ensign Carburetor Co.
Eri—Erie Malleable Iron Co.

Exi—Exide (Elec. Storage Battery Co.)
Fed—Fedders-Quigan Corp.
Frd—Ford Motor Co.
Ful—Fuller Mfg. Co.
Gem—Gemmer Mfg. Co.
GO—G & O Mfg. Co.
Han—Handy (King Seelye Corp.)
Har—Harrison Radiator Div.
Her—Hercules Motor Corp.
Hof—Hoof Products Co.
H-S—Hall-Scott Motor Car Co.
Inl—Inland Mfg. Div.
Jms—Jamestown Metal Equipment Co.
KHM—Kelsey Hayes or Motor Wheel
K-S—King Seelye Corp.
L-N—Leece Neville Corp.
Lmg—Long Mfg. Div.
L-R—Lipe Rollway Corp.
Lub—Luber-Finer, Inc.
Mal—Mallory Electric Corp.
Mar—Maremont Auto. Prod., Inc.
Mat—Mather Spring Co.
McC—McCord Radiator & Mfg. Co.
Mic—Michiana Products Corp.
Mid—Midland Steel Products Co.
Mod—Modine Mfg. Co.
Mur—Murray Corp. of America
MW—Motor Wheel Corp.
Nat—National Battery Co.
NEP—New England Products
NP—New Process Gear

Nug—Wm. W. Nugent Co.
Oak—Oakes North Chicago Div.
Par—Parish (Spicer Mfg. Div.)
Pce—Pierce Governor Co.
Pfx—Perfex Corp.
Pur—Purulator Products, Inc.
Ro—Ross Gear & Tool Co.
Roc—Rockford Clutch Div.
Sag—Saginaw Steering Gear Div.
Ser—Service Spring Co.
Spi—Spicer Mfg. Div.
SS—Standard Steel Spring Co.
Til—Tillotson Mfg. Co.
Tim—Timken-Detroit Axle Co.
T-S—Tru-Stop (Amer. Chain & Cable Co.)
Tut—Tuthill Spring Co.
Uni—United Air Cleaner Div.
UP—Universal Products Co.
US—United States Spring & Bumper Co.
Var—Various
Vor—Vortex Mfg. Co.
War—Warner Gear Div.
Wau—Waukesha Motor Co.
WCL—W. C. Lipe (Lipe Rollway Corp.)
WGB—W-G-B Oil Clarifier, Inc.
Wil—Willard Storage Battery Co.
Win—Winslow Eng. Co.
Wys—Willys Overland Motors, Inc.
Yng—Young Radiator Co.
Zen—Zenith Carburetor Div.

Line Number	TRUCK MAKE AND MODEL NUMBER	POWER PLANT ACCESSORIES					ELECTRICAL EQUIPMENT				CLUTCH	UNIVERSALS	RUNNING GEAR					
		ENGINE Make and Model	Governor Make— (If Standard)	Air Cleaner Make (If Standard)	Oil Filter Make (If Standard)	CARBURETOR Make and Model Number	Fuel Feed System Make	Radiator Make	Ignition System Make	Generator—Starter Make			Battery—Make	STEERING GEAR Make and Model Number	Hand Brakes Make of Actuation	Brake Drum Make	Wheels—Make	Spring—Make
BROCKWAY																		
1	88WH	Con 38B	Uni	WGB	Zen 63A12	AC	GO	AL	AL	Exi	LR 13 in.	Spl 1410	Re TA14	War	Tim	Bdd	Est	Par
2	128W	Con 40B	Uni	WGB	Zen 63A14	AC	GO	AL	AL	Exi	LR 13 in.	Spl 1500	Re TA14	TS	Tim	Bdd	Est	Par
3	146W	Con 40B	KS	Uni	WGB	Zen 63A14	AC	GO	AL	AL	Exi	Spl 1500	Re TA66	TS	Tim	Bdd	Est	Par
4	148W	Con 42BX	KS	Uni	WGB	Zen 63AW18	AC	GO	AL	AL	Exi	Spl 1500	Re TA68	TS	Tim	Bdd	Est	Par
5	151W, 153W	Con 42BX	KS	Uni	WGB	Zen 63AW18	AC	GO	AL	AL	Exi	Spl 1500	Re TA71	TS	4	Bdd	Est	Par
6	152W	Con 42BX	Uni	WGB	Zen 63AW18	AC	GO	AL	AL	Exi	LR 14 in.	Spl 1500	Re TA71	TS	(1)	Bdd	Est	Par
7	154W(T)	Con 42BX	Uni	WGB	Zen 63AW18	AC	GO	AL	AL	Exi	LR 14 in.	Spl 1500	Re TA66	TS	(2)	Bdd	Est	Par
8	154WH(T)	Con 46B	Uni	Mic	Zen 63AW18	AC	GO	AL	AL	Exi	LR 14 in.	Spl 1500	Re TA66	TS	(2)	Bdd	Est	Par
9	240XW	Con 46B	Uni	Mic	Zen 63AW18	AC	GO	AL	AL	Exi	LR 14 in.	Spl 1500	Re TA71	TS	(1)	Bdd	Est	Par
10	260XW	Con 46B	Uni	Mic	Zen 63AW18	AC	GO	AL	AL	Exi	LR 15 in.	Spl 1600	Re TA71	TS	(3)	Bdd	Est	Par
11	260XL	Con 46B	Uni	Mic	Zen 63AW18	AC	GO	AL	AL	Exi	LR 14 in.	Spl 1600	Re TA71	TS	Tim	Bdd	Est	Par
12	260XWL	Con 48B	Uni	Mic	Zen 63AW18	AC	GO	AL	AL	Exi	LR 15 in.	Spl 1600	Re TA71	TS	Tim	Bdd	Est	Par
CHEVROLET																		
13	GP, GR, GS	O-T/Master	AC	Car-WI-684S	AC	Har	DR	DR	DR	DR	Int	Spl	Sag	Own	BK	Own	Own	Own
14	GT, GU	O-T/Master	AC	Car-BBI-699S	AC	Har	DR	DR	DR	DR	Int	Spl	Sag	Own	BK	Own	Own	Own
15	SJ, SK	O-T/Master (6)	AC	Car-WI-6843	AC	Har	DR	DR	DR	DR	Int	Spl	Sag	Own	BK	Own	Own	Own
16	SL	O-T/Master (6)	Har	Car-WI-6843	AC	Har	DR	DR	DR	DR	Int	Spl	Sag	Own	BK	Own	Own	Own
17	SP(S), SR(S), SS(S)	O-L/Master	Har	Car-BBI-517S	AC	Har	DR	DR	DR	DR	Int	Spl	Sag	Own	BK	Own	Own	Own
18	SV(S), SW(S), SX	O-L/Master	Har	Car-WI-6843	AC	Har	DR	DR	DR	DR	Int	Spl	Sag	Own	BK	Own	Own	Own
CORBITT																		
19	188G, 18TG, H18TG	Con M6330	Zen	Uni	Fram	Zen 63AW12R	AC	Pfx	DR	DR	Exi	Spl 1500	Re TA66	Cla	Day	Day	Mar	Par
20	228G	Con B6371	Zen	Uni	Con	Zen 29W12R	AC	Pfx	DR	DR	Exi	Spl 1800	Re TA66	Ful	Day	Day	Mar	Par
21	22TG, H22TG, 258G	Con B6427	Zen	Uni	Con	Zen 29-14R	AC	Pfx	DR	DR	Exi	Spl 1600	Re TA68	Ful	Day	Day	Mar	Par
22	22FG	Con B6371	Zen	Uni	Con	Zen 29W12R	AC	Pfx	DR	DR	Exi	LR 230S	Re 700	AmC	Tim	Bdd	Mar	Par
23	25TG, H25TG	Con R6513	Con	Uni	Mic	Zen 29W16	AC	Pfx	DR	DR	Exi	LR 242S	Re TA70	Own	Day	Day	Mar	Par
24	26TG	Con R6602	Con	Uni	Mic	Zen 29W16	AC	Pfx	DR	DR	Exi	LR 240SX	Re TA70	Own	Day	Day	Mar	Par
25	28TG	Con R6602	Con	Uni	Mic	Zen 29W16	AC	Pfx	DR	DR	Exi	LR 240SX	Re T74	Own	Day	Day	Mar	Par
26	22TD, H22TD	Her DWXD	Her	Pur	...	AB	Pfx	DR	DR	Exi	LR 231S	Spl 1600	Re TA66	Ful	Bdd	Bdd	Mar	Par
27	25TD, H25TD	Her DRXC	Her	Pur	...	AB	Pfx	DR	DR	Exi	LR 242S	Spl 1700	Re TA70	Own	Bdd	Bdd	Mar	Par
28	27TD, H27TD	Cum HB600	Cum	DeL	...	Cum	Pfx	DR	DR	Exi	LR 240SX	Spl 1700	Re T74	Own	Day	Day	Mar	Par
29	28TD	Cum NHB600	Cum	Lub	...	Cum	Pfx	DR	DR	Exi	LR 240SX	Spl 1700	Re T74	Own	Day	Day	Mar	Par
CROSLEY																		
30	A11	Own	Uni	Fram	Til DY-9C	AC	Yng	AL	AL	AL	Roc	NEP	Re S12	Own	Own	MW	Mat	Own
DIAMOND T																		
31	201, 306	Her QXLD	Uni	Fram	Zen	AC	Own	AL	AL	Exi	B&B 10A7	Spl 1350	Re 660	War	Var	CB	Own	Own
32	404, 509SC	Her JXB	KS	Uni	Fram	Zen	AC	Own	AL	AL	B&B 11A6	Spl 1410	Re 660	War	Var	CB	Own	Own
33	509	Her JXC-JXD	KS	Uni	Fram	Zen	AC	Own	AL	AL	B&B 11A6	Spl 1410	Re 660	War	Var	CB	Own	Own
34	614	Her JXD	KS	Uni	Fram	Zen	AC	Own	AL	AL	BL 12ML	Spl 1500	Re 700	Cla	Var	CB	Own	Own
35	614	Her JXLD	KS	Uni	Fram	Zen	AC	Own	AL	AL	BL 12ML	Spl 1500	Re 700	Cla	Var	CB	Own	Own
36	404SC	Her JXE	KS	Uni	WGB	Zen	AC	Own	AL	AL	B&B 11A6	Spl 1410	Re 660	War	Var	CB	Own	Own



PARTS Specifications Table

Submitted by Truck Manufacturers

Line Number	TRUCK MAKE AND MODEL NUMBER	POWER PLANT ACCESSORIES						ELECTRICAL EQUIPMENT				CLUTCH	UNIVERSALS	RUNNING GEAR					
		ENGINE Make and Model	Governor Make— (If Standard)	Air Cleaner Make (If Standard)	Oil Filter Make (If Standard)	CARBU- RETOR Make and Model Number	Fuel Feed System Make	Radiator Make	Ignition System Make	Generator—Starter Make	Battery—Make			STEERING GEAR Make and Model Number	Hand Brakes Make of Actuation	Brake Drum Make	Wheels—Make	Springs—Make	Frame—Make
DIAMOND T—(Cont.)																			
37	508SCH	Her JXC	KS	Uni	WGB	Zen	AC	Own	AL	AL	AL	B&B 11A6	Spi 1410	Ro 660	Cla	Var	CB	Own	Own
38	702A	Her WXL	Pce	Uni	Fram	Zen	AC	Own	AL	AL	AL	Roc 14TT	Spi 1600	Ro TA66	TS	Var	CB	Own	Own
39	703	Con T6427	KS	Uni	Fram	Zen	AC	Own	AL	AL	AL	Roc 14TT	Spi 1600	Ro TA66	TS	Var	CB	Own	Own
40	704	Her TDXB	Pce	Uni	Mic	Zen	AC	Own	AL	AL	AL	BL 14ML	Spi 1600	Ro TA66	TS	Var	CB	Own	Own
41	808A	Her WXL	Pce	Uni	Fram	Zen	AC	Own	AL	AL	AL	Roc 14TT	Spi 1600	Ro TA66	TS	Var	CB	Own	Own
42	809	Con T6427	KS	Uni	Fram	Zen	AC	Own	AL	AL	AL	Roc 14TT	Spi 1600	Ro TA66	TS	Var	CB	Own	Own
43	901	Con T6572	Con	Uni	Fram	Zen	AC	Own	AL	AL	AL	Roc 15TT	Spi 1600	Ro TA71	TS	Var	CB	Own	Own
44	910	Cum HB600	AB	Uni			AB	Own	DR	DR		Spi 14 in.	Spi 1700	Ro TA71	TS	Var	CB	Own	Own
45	910N	Cum NHB600	AB	Uni			AB	Own	DR	DR		Spi 14 in.	Spi 1700	Ro TA71	TS	Var	CB	Own	Own
DART																			
46	100	Wau 140GK		Don	Fram	Zen 29W14S	AC	Own	DR	DR	Wii	LR 140-1-295	Spi 1600	Ro TA71	AmC	Tim	Bdd	Tut	Own
47	110	DD 6094		Don	Pur		AB	Own	DR	DR	Wii	LR 150-1-150	Spi 1700	Ro TA71	AmC	Tim	Bdd	Tut	Own
48	140	Her DFXH		Don	Pur		AB	Own	DR	DR	Wii	LR 170-1-264	Spi 1800	Ro T74	AmC	Tim	Bdd	Tut	Own
49	200/3010	Wau 140GK		Don	Fram	Zen 29W14S	AC	Own	DR	DR	Wii	LR 140-1-295	Spi 1600	Ro TA71	AmC	Tim	Bdd	Tut	Own
50	200/456	Wau 140GK		Don	Fram	Zen 29W14S	AC	Own	DR	DR	Wii	LR 140-1-295	Spi 1700	Ro TW74	AmC	Tim	Bdd	Tut	Own
51	250/462	Wau 145GK		Don	Fram	Zen 29W14S	AC	Own	DR	DR	Wii	LR 150-1-150	Spi 1700	Ro T74	AmC	Tim	Bdd	Tut	Own
52	250/472	Her DFXH		Don	Pur		AB	Own	DR	DR	Wii	LR 170-1-264	Spi 1800	Ro T74	AmC	Tim	Bdd	Tut	Own
DODGE																			
53	B-1-B, B-1-C	Own 218		Uni		Car DTC-1	AC	BLA	AL	AL	AW	B&B 11260	CS P96	Gem 305	Own	Own	BM	Det	Mur
54	B-1-D	Own 230		Uni		Str 380982	AC	BLA	AL	AL	AW	B&B 11260	UP 5160	Gem 305	Own	Own	Bdd	Det	Mur
55	B-1-DU	Own 230		AC		Str 380982	AC	BLA	AL	AL	AW	B&B 11260	UP 5160	Gem 305	Own	Own	Bdd	Det	AOS
56	B-1-PW	Own 230	(5)	AC	Pur	Car E7-F1	AC	BLA	AL	AL	AW	B&B 11303	UP 5160	Gem B-60	Own	Own	Bdd	Det	Mur
57	B-1-EU	Own 230		AC		Str 380982	AC	BLA	AL	AL	AW	B&B 10939	UP 5160	Gem B-60	Own	Own	Bdd	Det	AOS
58	B-1-F, B-1-FA	Own 237		Uni		Car ETT-1	AC	FED	AL	AL	AW	B&B 11296	CS 096	Gem B-60	Own	Own	Bdd	Det	Mid
59	B-1-H, B-1-HA	Own 237		Han	AC	Car ETT-1	AC	FED	AL	AL	AW	B&B 10939	CS 096	Gem B-60	Own	Own	Bdd	Det	Mid
60	B-1-FM, B-1-FMA	Own 237		Uni		Car 6M-1	AC	FED	AL	AL	AW	B&B 11296	CS 096	Gem B-60	Own	Own	Bdd	Det	Mid
61	B-1-HM, B-1-HMA	Own 237		Han	AC	Car 6M-1	AC	FED	AL	AL	AW	B&B 10939	CS 096	Gem B-60	Own	Own	Bdd	Det	Mid
62	B-1-J, B-1-JA	Own 251		Han	Uni	Car ETT-1	AC	FED	AL	AL	AW	B&B 10939	UP 5370	Gem B-60	Own	Own	Bdd	Det	Mid
63	B-1-KA	Own 251		Han	AC	Car ETT-1	AC	FED	AL	AL	AW	B&B 10939	UP 5370	Gem B-60	Own	Own	Bdd	Det	Mid
64	B-1-JM, B-1-JMA	Own 251		Han	Uni	Car 6M-1	AC	FED	AL	AL	AW	B&B 10939	UP 5370	Gem B-60	Own	Own	Bdd	Det	Mid
65	B-1-KMA	Own 251		Han	AC	Car 6M-1	AC	FED	AL	AL	AW	B&B 10939	UP 5370	Gem B-60	Own	Own	Bdd	Det	Mid
66	B-1-R, B-1-RA	Own 282	(5)	AC	Pur	Car EYC-4	AC	BLA	AL	AL	AW	B&B 11675	CS D-96	Gem B-60	Own	OT	Bdd	Det	Mid
67	B-1-T, B-1-TA, B-1-V, B-1-VA, B-1-VX	Own 331	(5)	AC	Pur	Car E7-B1	AC	BLA	AL	AL	AW	B&B 11581	CS U96	Ro TA26	Own	OT	Bdd	Det	Mid
DUPLEX																			
68	TH	Her JXD				Zen 28AV11	AC	Own	AL	AL	Wii	B&B 13 in.	Spi 1500	Ful TA27072		Tim	MW	Tut	Own
69	TH339	Her JXL				Zen 29W14	AC	Own	AL	AL	Wii	B&B 13 in.	Spi 1500	Ful TA27121		Tim	MW	Tut	Own
70	RH	Her WXL3				Zen 28AV12	AC	Own	AL	AL	Wii	B&B 13 in.	Spi 1600	Ful TA67061		Tim	MW	Tut	Own
71	KH, JH	Her RXC				Zen IN167SJ	AC	Own	AL	AL	Wii	B&B 14 in.	Spi 1600	Ful TA72243		Tim	MW	Tut	Own
72	SH601	Her RXB				Zen IN167SJ	AC	Own	AL	AL	Wii	B&B 14 in.	Spi 1600	Ful TA72243		Tim	MW	Tut	Own
73	LH	Her RXLD				Zen IN167SJ	AC	Own	AL	AL	Wii	LR 15 in.	Spi 1700	Ful TA72152		Tim	MW	Tut	Own
74	LHS6	HS 400				Zen 1510MVM2	AC	Own	DR	AL	Wii	LR 15 in.	Spi 1700	Ful TA72152		Tim	MW	Tut	Own
75	LHS6	HS 480				Zen 1510MVM2	AC	Own	DR	AL	Wii	LR 15 in.	Spi 1700	Ful TA72152		Tim	MW	Tut	Own
FEDERAL																			
76	16M Series	Her JXEF		Uni	Pur	Car	AC	Lng	DR	DR	AL	B&B 11 in.	Spi 1300	Gem 335			BD	Det	Par
77	18M Series	Her JXBF		Uni	Pur	Car	AC	Lng	DR	DR	AL	B&B 11 in.	Spi 1300	Gem 335			BD	Det	Par
78	25M Series	Her JXCF		Uni	Fram	Car	AC	Lng	DR	DR	AL	B&B 12 in.	Spi 1400	Gem 335			BD	Det	Par
79	29M Series	Her JXDF		Hof	Don	Fram	AC	Lng	DR	DR	AL	B&B 12 in.	Spi 1500	Gem 335-3			BD	Det	Par
80	29ML Series	Her JXLDF		Hof	Don	Fram	AC	Lng	DR	DR	AL	B&B 12 in.	Spi 1500	Gem 335-3			BD	Det	Par
81	35M Series	Con T6371		Hof	Don	Mic	AC	Lng	DR	DR	AL	B&B 13 in.	Spi 1500	Gem 375			BD	Det	Par
82	45M, 65M Series	Con T6427		Mal	Don	Zen	AC	Lng	DR	DR	Exi	Lng 14 in.	Bld 1600	Gem 400			BD	Det	Par
83	60M Series	Con T22R		Zen	Don	Mic	AC	Lng	DR	DR	Exi	Lng 14 in.	Bld 1600	Gem 500			BD	Det	Par
84	65M Series	Con R6602		Con	Don	Mic	AC	Lng	DR	DR	Exi	Lng 15 in.	Bld 1700	Gem 500			BD	Det	Par
85	629M Series	Her JXDF		KS	Don	Fram	AC	Lng	DR	DR	AL	B&B 12 in.	Spi 1500	Gem 335-3			BD	Det	Par
86	629ML Series	Her JXLDF		KS	Don	Fram	AC	Lng	DR	DR	AL	B&B 13 in.	Spi 1500	Gem 335-3			BD	Det	Par
87	635M Series	Con T6371F		KS	Don	Don	AC	Lng	DR	DR	Exi	B&B 13 in.	Spi 1500	Gem 375			TS	DM	BD
88	645M Series	Con T6427F		KS	Don	Don	AC	Lng	DR	DR	Exi	B&B 14 in.	Bld 1600	Gem 400			TS	BD	BD
89	663M, 664M Series	Con R6602		Con	Don	Mic	AC	Lng	DR	DR	Exi	Lng 15 in.	Bld 1700	Gem 500			Bdd	Det	Par
FORD																			
90	F1 to F6	Own		Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own
91	F7 & F8	Own		Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own	Own
FWD																			
92	HA	Wau BZ		AM	Mic	Zen 29BU16	AC	Own	AL	AL	Wii	Own-LR H	Bld 5N	Ro TA66	Own	Own	Own	Own	Own
93	HG, HR, HRT	Wau MZA		AM	Mic	Zen IN167SJ	AC	Own	DR	DR	Wii	Own-LR H14	Bld 5N	Ro TA66	Own	Own	Own	Own	Own
94	SU	Wau SRKR		AM	Mic	Zen IN167SJ	AC	Own	DR	AL	Wii	Own-LR U14	Bld 6N	Ro TW74	Own	Own	Own	Own	Own
95	YU	Wau 140GK		Don	Mic	Zen 29-14	AC	Own	DR	DR	Wii	Own-LR U15	Bld 6N	Ro TW74	Own	Own	Own	Own	Own
96	MZ	Wau 140GZ		Don	Mic	Zen 29-16	AC	Own	DR	DR	Wii	Own-LR U15	Bld 6N	Ro TW74	Own	Own	Own	Own	Own
97	M7, M10	Wau 145GK		AM	Mic	Zen W16	AC	Own	DR	DR	Wii	Own-LR M14	Bld 7N	Ro P720	Own	Tim	Bdd	Own	Own
98	M7D, M10D	Bud 844		Don	DeL		Bud	Own	DR	DR	Wii	Own-LR M14	Bld 7N	Ro P720	Own	Tim	Bdd	Own	Own
99	M6X6	Wau LR6		AM	Mic	Zen W16	AC	Own	DR	DR	Wii	Own-LR M15	Bld 7N	Ro P720	AmC	Tim	Bdd	Own	Own
100	M6X6D	Bud 844		Don	DeL		Bud	Own	DR	DR	Wii	Own-LR M15	Bld 7N	Ro P720	AmC	Tim	Bdd	Own	Own

COMPONENT PARTS Continued from Page 115

Line Number	TRUCK MAKE AND MODEL NUMBER	POWER PLANT ACCESSORIES					ELECTRICAL EQUIPMENT					CLUTCH	UNIVERSALS	RUNNING GEAR					
		ENGINE	Governor Make—(If Standard)	Air Cleaner Make (If Standard)	Oil Filter Make (If Standard)	CARBURETOR	Fuel Feed System	Radiator Make	Ignition System	Generator—Starter Make	Battery—Make			STEERING GEAR	Hand Brakes Make or Actuation	Brake Drum Make	Wheels—Make	Spring—Make	
101	KENWORTH	Cum HB600	Own	Don	Nug	---	---	Pfx	---	DR	Exl	BL 14 in.	Spl 1700	Gem 500	TS	Tim	Bdd	Own	
102	821, 822, 823, 824, 848, 852, 864.	Bud LB525	Own	Don	DeL	Zen	---	Pfx	---	DR	Exl	LR 14 in.	Spl 1700	Gem 500	TS	Tim	Bdd	Own	
103	825.	Cum HB600	Own	Don	Nug	---	---	Pfx	---	DR	Exl	BL 14 in.	Spl 1700	Gem 500	TS	Tim	Bdd	Own	
104	886.	Cum NHB600	Own	Don	Nug	---	---	Pfx	---	DR	Exl	BL 14 in.	Spl 1700	Gem 500	TS	Tim	Bdd	Own	
105	LINN	Her QXC3	---	Doi	---	Zen 63AW10	AC	GO	AL	AL	AL	LR 12ML	UP	Sag 630-061	NP	Eri	Bdd	Tut	
106	Linn L2, L4, Linn L6, L8.	Her JXE3	---	Doi	---	Zen 63AW10	AC	GO	AL	AL	AL	LR 12ML	UP	Sag 630-061	NP	Eri	Bdd	Tut	
107	MARMON-HERRINGTON	Wys CJ-2A	Hof	Uni	Frd	Car 596S	AC	Yng	AL	DR	AL	B&B	Spl 1350	Ro TA15030	Own	Own	Bdd	Ser	
108	DVL4.	Frd 8RT (239)	Frd	Frd	Frd	Frd	AC	Frd	Frd	Frd	Frd	Frd	---	Frd	Frd	Frd	Frd	Frd	
109	Q5, Q6, Q5-6, Q6-6.	Frd REQ (337)	Frd	Frd	Frd	Frd	AC	Frd	Frd	Frd	Frd	Frd	---	Frd	Frd	Frd	Frd	Frd	
110	MH440-4, MH440-6.	Her WXL3	KS	Don	Mic	Zen 28	AC	Yng	DR	DR	AL	BL 232S	Spl 1500	Ro TA71	AmC	Tim	Bdd	SS	
111	MH555-4, MH555-6.	Her RXC	KS	Don	Mic	Zen 29	AC	Yng	DR	DR	AL	BL 231S	Spl 1500	Ro TA71	AmC	Tim	Bdd	SS	
112	MILFORD	Wau 6MZA	Wau	AM	Mic	Zen 63AW12	AC	Pfx	D-R	D-R	Exl	L-R 14ML	Bld 6N	Ro TA71	AmC	Tim	Bdd	Tut	
113	QYH.	Wau 140GK	Wau	Vor	Mic	Zen 63AW18	AC	Pfx	D-R	D-R	Exl	L-R 15ML	Bld 7N	Ro TW74	AmC	Tim	Bdd	Tut	
114	OSHKOSH	Her WXLCO3	Pce	Don	Mic	Zen 29AW14	AC	Pfx	DR	DR	Wll	LR 14SP	Spl 1500	Ro TA71	Own	Own	Bdd	Tut	
115	W1700.	Her RXC	Pce	Don	Mic	Zen 29AW14	AC	Pfx	DR	DR	Wll	LR 14SP	Spl 1600	Ro TA71	Own	Own	Bdd	Tut	
116	W700.	Her RXCO	Pce	Don	Mic	Zen 29AW14	AC	Pfx	AL	DR	Wll	LR 14SP	Spl 1600	Ro TA71	Own	Own	Bdd	Tut	
117	W703, W705.	Her RXLD	Pce	Don	Mic	Zen 29AW14	AC	Pfx	AL	DR	Wll	LR 14SP	Spl 1600	Ro TA71	Own	Own	Bdd	Tut	
118	W703D.	Her DRXC	Bos	Don	Pur	---	Bos	Pfx	---	---	(8)	Wll	LR 14SP	Spl 1600	Ro TA71	Own	Own	Bdd	Tut
119	W2200.	Bud 8MO779	Pce	Don	DeL	Zen 63AW16	AC	Pfx	DR	DR	Wll	LR 15SP	Spl 1700	Ro TA71	Own	Own	Bdd	Tut	
120	W2201.	Bud 8MO893	Pce	Don	DeL	Zen 63AW16	AC	Pfx	DR	DR	Wll	LR 15SP	Spl 1700	Ro TA71	Own	Own	Bdd	Tut	
121	W2204.	Bud 8DC844	Bos	Don	DeL	---	Bos	Pfx	---	---	---	LR 17SP	Spl 1700	Ro TA71	Own	Own	Bdd	Tut	
122	W2205.	Bud 8DC844	Bos	Don	(11)	---	Bos	Pfx	---	---	---	LR 17SP	Spl 1700	Ro TA71	Own	Own	Bdd	Tut	
123	W2208.	HS 400	HS	Don	HS	Zen1510MWM2	AC	Pfx	DR	(9)	Wll	LR 15SP	Spl 1700	Ro TA71	Own	Own	Bdd	Tut	
124	W703-6X6.	Her RXLD	Pce	Don	Mic	Zen 29AW14	AC	Pfx	AL	DR	Wll	LR 14SP	Spl 16, 1700	Ro TA71	Own	Own	Bdd	Tut	
125	W1600CD.	Cum HB-600	Cum	Don	Cum	---	Cum	Pfx	---	---	---	LR 15SP	Spl 17, 1800	Ro TA71	Own	Own	Bdd	Tut	
126	W1600BD.	Bud 8DC844	Bos	Don	DeL	---	Bos	Pfx	---	---	---	LR 15SP	Spl 17, 1800	Ro TA71	Own	Own	Bdd	Tut	
127	W1600BQ.	Bud 8MO893	Pce	Don	DeL	(10)	AC	Pfx	(7)	DR	Wll	LR 15SP	Spl 17, 1800	Ro TA71	Own	Own	Bdd	Tut	
128	PETERBILT	(12) Cum HB600	Cum	Don	Cum	---	Cum	Pfx	---	---	---	BL 13 or 14DP	Spl 1700	Ro T71	TS	Tim	Bdd	US	
129	350.	(12) Cum NHB600	Cum	Don	Lub	---	Cum	Pfx	---	---	---	BL 13 or 14DP	Spl 1700	Ro T71	TS	Tim	Bdd	US	
130	360.	(12) C m NHB800	Cum	Don	Lub	---	Cum	Pfx	---	---	---	BL 13 or 14DP	Spl 1700	Ro T71	TS	Tim	Bdd	US	
131	370.	(12) HS400(gas)	HS	Vor	Win	Zen 1510	AC	Pfx	LN	AL	Exl	BL 13 or 14DP	Spl 1700	Ro T71	TS	Tim	Bdd	US	
132	380.	(12) HS400(but)	HS	Vor	Win	Algas	---	Pfx	LN	AL	Exl	BL 13 or 14DP	Spl 17 or 1800	Ro T71	TS	Tim	Bdd	US	
133	REO	Own GC245	KS	Uni	Fram	Zen 28BV11	AC	Fed	DR	DR	Wll	B&B 11A6	Spl 1410	Ro TA14	Own	---	DM	SS	
134	D19X.	Own GC245	KS	Uni	Fram	Zen 28BV11	AC	Mod	DR	DR	Wll	B&B 11A6	Spl 1410	Ro TA14	Own	---	DM	SS	
135	D21.	Own GC288	KS	Uni	Fram	Zen S404A	AC	Mod	DR	DR	Wll	Lng 12CF	Spl 1410	Ro TA14	Own	---	D'M	SS	
136	D21R.	Own GC310	KS	Uni	Fram	Zen 28BV12	AC	Mod	DR	DR	Wll	Lng 12CF	Spl 1500	Ro TA26	Own	---	BDM	SS	
137	D22.	Own GC310H	KS	Uni	Fram	Zen 28ADA10	AC	Mod	DR	DR	Wll	Lng 12CF	Spl 1500	Ro TA26	Own	---	BDM	SS	
138	D22R, D226R.	Own GC310H	KS	Uni	Fram	Zen 28ADA10	AC	Mod	DR	DR	Wll	Lng 12CF	Spl 1500	Ro TA26	Own	---	MW	SS	
139	D23S.	Con T6371	Hof	AM	Fram	Zen 29W16	AC	Mod	DR	DR	Wll	WCL 232S	Spl 1600	Gem 400	Cla	---	DM	SS	
140	D23.	Con T6427	Hof	AM	Fram	Zen 29W16	AC	Mod	DR	DR	Wll	WCL 232S	Spl 1600	Gem 400	Cla	---	DM	SS	
141	D23R, D236.	Con T6427	Hof	AM	Fram	Zen 29W16	AC	Mod	DR	DR	Wll	WCL 232S	Spl 1600	Gem 400	Cla	---	BD	SS	
142	30.	Con R8513	Con	AM	Fram	Zen 29W16	AC	Mod	DR	DR	Wll	Roc 15TT	Spl 1700	Ro TA71	Spl	---	BD	SS	
143	31, 316.	Con R8602	Con	AM	Fram	Zen 29W16	AC	Mod	DR	DR	Wll	Roc 15TT	Spl 1700	Ro TA71	Spl	---	BD	SS	
144	STERLING	HD97, HD105, HA1401	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1800	Ro TA71	Own	Tim	Bdd	Mar	
145	DD115, DD115, DD145	Wau 6SRKR	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1800	Ro TA71	Own	Tim	Bdd	Mar	
146	DD145.	Wau 145GK	Wau	Don	DeL	Zen 29-16	AC	Mod	DR	DR	Nat	LR 15 in. SP	Spl 1700	Gem 550	Own	Tim	Bdd	Mar	
147	HD115H, HD145H	Cum HB800	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
148	DD145H.	Cum HB800	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Gem 550	Own	Tim	Bdd	Mar	
149	HC97, HC105.	Wau 6MZA	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Bld 60N	Ro TA71	Own	Tim	Bdd	Mar	
150	HC115, HC144, HC147, HC159	Wau 6SRKR	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Bld 60N	Ro TA71	Own	Tim	Bdd	Mar	
151	HC175, HC250.	Wau 145GK	Wau	Don	DeL	Zen 29-16	AC	Yng	DR	DR	Nat	LR 15 in. SP	Bld 70N	Gem 550	Own	Tim	Day	Mar	
152	HC115H.	Cum HB800	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
153	HC175H, HC250H.	Cum HBD600	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Bld 70N	Gem 550	Own	Tim	Day	Mar	
154	HBS130, HDS140.	Wau 6MZA	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1800	Ro TA71	Own	Tim	Bdd	Mar	
155	DD5160.	Wau 140GK	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
156	HWS160.	Wau 6SRKR	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
157	HA2205.	Wau 140GK	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
158	HWS235G.	Wau 140GK	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1700	Gem 550	Own	Tim	Bdd	Mar	
159	HWS235.	Wau 145GK	Wau	Don	DeL	Zen 29-16	AC	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Gem 550	Own	Tim	Bdd	Mar	
160	HWS160H.	Cum HB800	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
161	HWS235H.	Cum HB800	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Gem 550	Own	Tim	Bdd	Mar	
162	HCS195.	Wau 140GK	Wau	Don	DeL	Zen IN167SJ	AC	Mod	DR	DR	Nat	LR 14 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
163	HCS285, HCS297, HCS330.	Wau 145GK	Wau	Don	DeL	Zen 29-16	AC	Yng	DR	DR	Nat	LR 15 in. SP	Bld 70N	Gem 550	Own	Tim	Bdd	Mar	
164	HCS195H.	Cum HB800	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1700	Ro TA71	Own	Tim	Bdd	Mar	
165	HCS285H, HCS297H, HCS330H.	Cum HBD600	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Bld 70N	Gem 550	Own	Tim	Bdd	Mar	
166	HCS340H.	Cum NHB600	Cum	Don	Cum	---	Cum	Yng	DR	DR	Nat	LR 15 in. SP	Spl 1800	Gem 550	Own	Tim	Day	Mar	
167	STUDEBAKER	2R5, 2R10	Own 1R	---	Uni	---	Car BBR1633S	AC	McC	AL	AL	Wll	B&B 9A7	Spl 1270	Ro T12	---	Bdd	Bdd	Own
168	2R15.	Own 2R	---	Uni	---	---	Car BBR1633S	AC	McC	AL	AL	Wll	B&B 9A7	Spl 1358	Ro T14	---	MW	MW	Own
169	2R16A.	Own 4R	---	Uni	---	---	Car BBR1608S	AC	McC	AL	AL	Wll	Ini "G"	Spl 1358	Ro T14	---	MW	MW	Own
170	2R17A.	Own 4R	---	Uni	---	---	Car BBR1608S	AC	McC	AL	AL	Wll	Ini "G"	Spl 1358	Ro T14	---	MW	MW	Own
171	WARD LA FRANCE	Con T6427	Hof	Uni	Mar	Zen 29W16	AC	Pfx	AL	AL	AL	USL LR 14 in. SP	Bld 6N	Ro TA66	---	Tim	Day	Mar	
172	D1C.	Con T6427	Hof	Uni	Mar	Zen 29W16	AC	Pfx	AL	AL	AL	USL LR 14 in. SP	Bld 6N	Ro TA71	---	Tim	Day	Mar	
173	D2K, D2KT2, D2Z.	Wau 140GK	Hof	Uni	Mar	Zen 29W14	AC	Pfx	AL	AL	AL	USL LR 15 in. SP	Spl 1700	Ro TA71	---	Tim	Day	Mar	
174	D3, D3T8.	Con R6572	Hof	Uni	Mar	Zen 29W16	AC	Pfx	AL	AL	AL	USL LR 15 in. SP	Spl 1700	Ro TA71	---	Tim	Day	Mar	
175	D3S, D3ST8.	Con R6602	Hof	Uni	Mar	Zen 29W16	AC	Pfx	AL	AL	AL	USL LR 15 in. SP	Spl 1700	Ro TA71	---	Tim	Day	Mar	
176	D5, D5T2, D5T8.	Cum HB800	Cum	---	---	(Diesel)	---	Pfx	---	---	---	USL LR 15 in. SP	Spl 1700	Ro TW74	---	Tim	Day	Mar	
177	D5N.	Cum NHB800	Cum	---	---	(Diesel)	---	Pfx	---	---	---	USL LR 15 in. SP	Spl 1700	Ro TW74	---	Tim	Day	Mar	
178	D1T2.	Con T6427	Hof	Uni	Mar	Zen 29W16	AC	Pfx	AL	AL	AL	USL LR 14 in. SP	Spl 16 or 1700	Ro TA71	---	Tim	Day	Mar	
179	D2KT8.	Wau 140GK	Hof	Uni	Mar	Zen 29W14	AC	Pfx	AL	AL	AL	USL LR 15 in. SP	Spl 1700	Ro TW74	---	Tim	Day	Mar	
180	WILLYS-OVERLAND	CJ-3A Jeep	Own	---															

STOPPING DISTANCES

For different types of trucks and combinations on various road surfaces and factors involved in braking

Stopping Distance

The stopping distance for any vehicle and driver is made up of reaction time plus the braking distance for the particular speed and road surface conditions.

Reaction Time

Reaction time is that split second it takes to hit the brake panel after a warning signal has been received. The time it takes to think the situation over before braking, though only a fraction of a second, is usually critical. Reaction time varies with drivers and with any one driver from day to day. Surprisingly enough, most drivers do not know their reaction time—and virtually all overestimate their ability to hit the brake pedal at a danger signal. This can lead to one thing—overconfidence, overspeeding and accidents.

Reaction Distance

It requires .4 second for the average driver to remove his foot from the accelerator and touch the brake pedal—even when he knows what to expect. Under actual driving conditions, when unforeseen circumstances necessitate use of the brakes, the average drive reaction time is .75 second. This means that at 20 mph the vehicle will travel 22 feet BEFORE the driver can reach the brake pedal. At a road speed of 60 mph, the vehicle will travel 66 feet before the brakes can be applied. Some drivers require as much as 1.5 seconds to react to a danger signal. At 40 mph such a driver would travel 88 feet before he put his foot on the brake pedal.

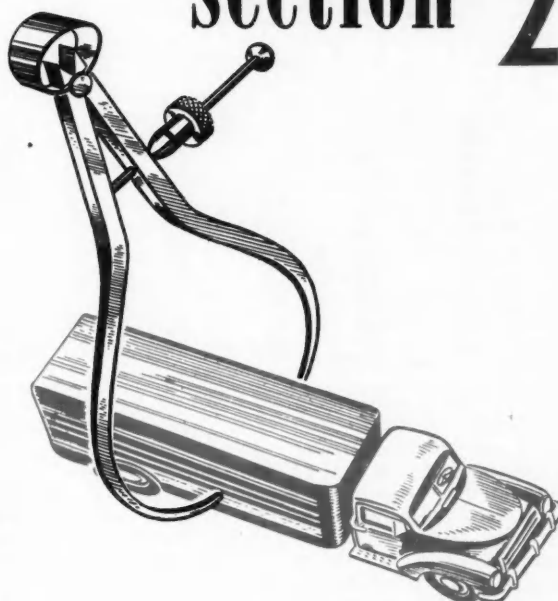
Table shows reaction time, braking distance and total stopping distance at various speeds for drivers with a reaction time of .75 sec.

Miles per Hour	Equivalent Feet per Second	Reaction-Time Distance (feet)	Braking Distance (feet)	Total Stopping Distance (feet)
10	14.7	11.0	7.5	18.5
15	22.0	16.5	16.9	33.4
20	29.3	22.0	30.0	52.0
25	36.7	27.5	46.9	74.4
30	44.0	33.0	67.5	100.5
35	51.3	38.5	91.9	130.4
40	58.7	44.0	120.0	164.0
45	66.0	49.5	151.9	201.4
50	73.3	55.0	187.5	242.5
55	80.7	60.5	226.9	287.4
60	88.0	66.0	270.0	336.0

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NINETEEN FORTY-NINE FLEET OPERATORS' REFERENCE ANNUAL

section 2



selection and operation

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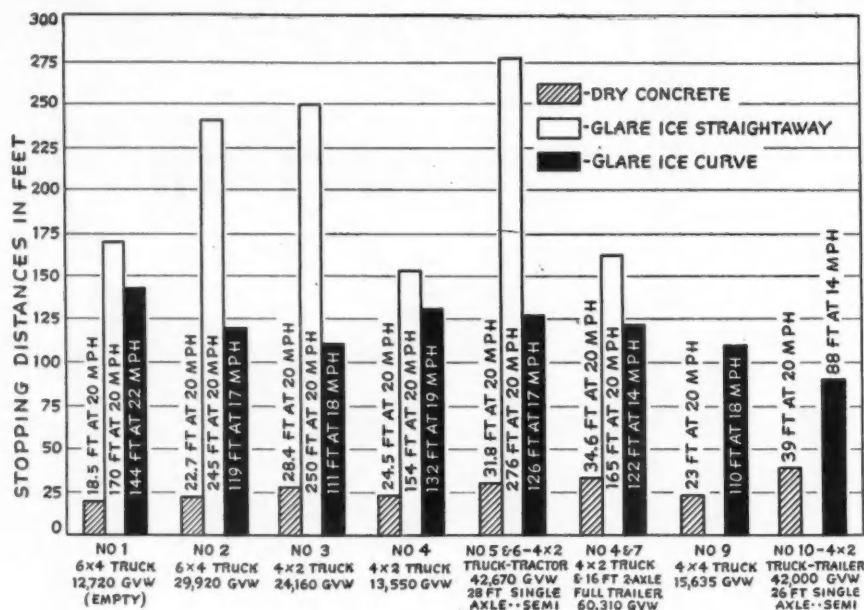
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Stopping Distances . . .

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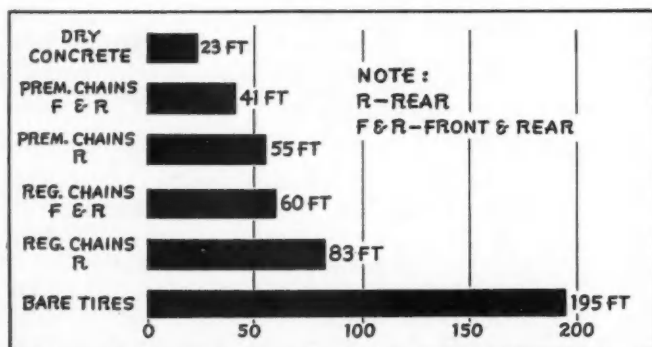


Comparison of the results of winter tests conducted on dry, level concrete, ice straightaway and glare ice curve for nine different trucks and combinations ranging in weights from 12,720 to 60,670 lb GVW. Stopping distances on dry concrete ranged from 18.5 ft (for 12,720-lb truck empty) to 39 ft for 42,000-lb tractor and 26-ft single-axle semi-trailer. Stopping distances on glare ice straightaway were from 5 to 10 times that of dry concrete. Vehicles could stop in shorter distance on an ice curve than on ice straightaway in all cases. Truck 9 and 10 did not make the test on glare ice straightaway.

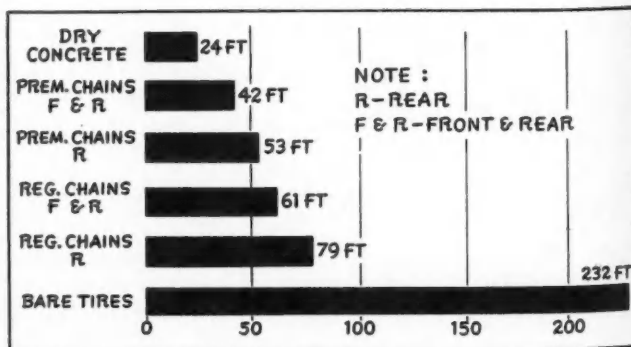
Effect of Chains and Fifth Wheel Location

Temperature	Fifth Wheel Location	Chains and Location	Critical Curve Speed	Braked Wheels Sliding	Stopping Distance in Feet
30 deg. F.	0	none	17	none	123
31 " "	15 1/2	none	18	none	116
32 " "	0	all wheels	18.5	all	39
32 " "	15 1/2	all wheels	17.5	all	44
33 " "	0	rear of tractor	20	all	42
32 " "	15 1/2	and semi	17.5	none	55

Chart shows the effect of fifth wheel location and use of chains. A 2-axle truck-tractor and semi-trailer equipped with air brakes was tested on a 200-ft. radius glare ice curve with the king pin of the fifth wheel located as noted. Results indicate that a slightly shorter stop was obtained when the fifth wheel was placed ahead of the center line of the rear axle. Tests with the same vehicle with and without premium chains as noted indicate that much shorter stops could be made with them. Stopping distance with chains was reduced about one third.



Clintonville tests on glare ice with a 5-ton vehicle showed that braking distance from a speed of 20 mph on ice was about 10 times that of dry concrete. Regular tire chains on rear wheels reduced braking distance from 232 to 79 ft. With premium chains on all wheels reduction amounted



to 82 per cent. Stopping distances were reduced with a loaded vehicle (left) on concrete, with premium chains, with bare tires. On this particular test, however, a loaded truck with regular chains took 4 ft. longer to stop than the empty truck. Graph at right is for empty vehicle.

Braking Distance

After the brake pedal is depressed and the brakes are applied, the braking distance is encountered. Braking distance will vary with vehicle speed, brake efficiency, road conditions and tire-to-ground contact. Braking distance varies as the square of the speed. Thus, brakes that will stop a vehicle in 30 ft at 20 mph will require 120 ft at a speed of 40 mph and 240 ft at 60 mph.

Tire Conditions

A comparison between the braking abilities of natural and synthetic rubber tires in Clintonville tests showed that natural rubber enabled the vehicle to stop in 84 to 169 ft, while synthetic tires required from 125 to 210 ft. On packed snow at a temperature of 0 deg braking distance averaged 95 ft with synthetic tires as against 89 ft with natural rubber. It was found that the common practice of reducing tire pressures to increase traction did not aid braking ability on ice.

Road Sanders

Road sanders may reduce braking distances on glare ice as much as 30 to 40 per cent if the proper type grit and braking technique are used. A comparison of four types of sanders in Clintonville tests showed that when the wheels were locked in the customary manner, braking distances were actually increased somewhat with three of the grits. The best grit, a sharp, angular slag product, reduced braking distance about 10 per cent. It was found that the best stops possible with sanders could be obtained by pumping the brakes and gearing down. This resulted in a reduction of braking distance from 30 to 40 per cent.

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POWER Ratings

For more popular gasoline and diesel truck engines showing maximum and net horsepower

ENGINE MAKE AND MODEL	Number of Cylinders Bore and Stroke (In.)	MAX. BRAKE H.P. at R.P.M.		Piston Displacement (Cu. In.)	Compression Ratio	TORQUE		Engine Weight without Carburetor or Ignition (Lb.)
		With Bare Engine	With Standard Accessories			Maximum Torque at R.P.M. (Lb. Ft.)	Maximum Torque at R.P.M. (Lb. Ft.)	
AUTOCAR								
377	6-4x5	119-2800		377.0	5.90	292-1400 (BE)	1230	
447	6-4½x5½	145-2700		447.0	5.90	352-1300 (BE)	1385	
501	6-4½x5½	165-2700		501.0	5.90	402-1100 (BE)	1395	
BUDA								
K-428	6-4½x4½	107-2400	95-2400	428.0	5.33	296-1100 (EA)	905	
LO-525	6-4½x5½	157-2400	139-2400	525.0	5.00	396-1200 (EA)	1195	
8MO-893	6-5½x6	199-2000	170-2000	893.0	5.50	490-1000	2400	
8MO-870	6-5½x6½	172-1400	147-1400	870.0	5.43	545-1000	2400	
CHEVROLET								
194	6-3½x3½	90-3300	81.5-3100	216.5	6.60	168-1100 (EA)	582	
194 (Note 1)	6-3½x3½	93-3100	83.5-3000	235.5	6.72	182-1000 (EA)	593*	
CONTINENTAL								
M-5271	6-3½x4½	89-2800		270.9	6.00	203-1200 (BE)	755	
M-5290	6-3½x4½	93-2800		289.9	6.00	217-1000 (BE)	755	
M-5330	6-4x4½	104-2800		329.4	6.10	245-1000 (BE)	755	
B-6371	6-4½x4½	100-2800		370.9	6.00	278-1000 (BE)	870	
T-6371	6-4½x4½	132-2800		370.9		296-1200 (BE)	1070	
B-6427	6-4½x4½	127-2800		427.2	5.90	323-1200 (BE)	875	
T-6427	6-4½x4½	151-2800		427.2	6.20	340-1200 (BE)	1075	
U-8501	6-4½x5½	170-2400		501.0	5.80	390-2400 (BE)		
R-8513	6-4½x5½	170-2400		512.9	5.90	400-1200 (BE)	1525	
R-8572	6-4½x5½	189-2800		571.7	5.90	440-1200 (BE)	1525	
R-8602	6-4½x5½	189-2800		602.0	5.80	464-1200 (BE)	1525	
R-8749	6-5½x5½	247-2800		748.8	6.10	576-1400 (BE)	1865	
DODGE								
T-142, T-144	6-3½x4½	95-3600	82-3200	217.8	6.60	172-1200 (BE)	500	
T-146	6-3½x4½	102-3600	82-3200	230.2	6.70	184-1200 (BE)	525	
T-147	6-3½x4½	94-3200	74-2800	230.2	6.70	185-1200 (BE)	570	
T-148, T-152	6-3½x4½	109-3600	89.5-3200	236.6	6.60	192-1200 (BE)	575	
T-150, T-154	6-3½x4½	114-3600	97.5-3200	250.6	6.60	204-1200 (BE)	590	
T-155	6-3½x4½	115-3600	108-3200	281.6	6.40	225-1200 (BE)	890	
T-156	6-3½x5	128-3000	111-2800	331.3	6.50	270-1200 (BE)	898	
FORD								
7HT	6-3.3x4.4	95-3300	87-3100	226.0	8.80	180-1200 (BE)	576	
8RT	6-3½x3½	100-3600	90-3500	239.0	8.80	180-2000 (BE)	598	
8EQ	6-3½x4½	145-3600	127-3300	337.0	6.40	255-1800 (BE)	894	
GMC (General Motors Truck)								
228	6-3½x3½	95-3200	85-3000	228.0	6.75	183-1000 (BE)		
248	6-3½x4½	100-3100	89-3000	248.5	6.75	202-1000 (BE)		
270	6-3½x4½	104-3000	95-3000	269.5	6.75	222-1000 (BE)		
308	6-3½x4½	122-3200	100-2800	308.2	6.00	241-1000 (BE)		
361	6-4½x4½	136-3000	115-2800	360.8	6.00	273-1000 (BE)		
428	6-4½x5	145-2600	127-2400	425.6	6.00	345-1000 (BE)		
477	6-4½x5	154-2600	135-2600	477.1	6.00	385-1000 (BE)		
HALL-SCOTT								
470	6-5½x6	245-2100		855.3	5.20	660-1600 (BE)	2116	
480	6-5½x6	266-2100		934.8	5.70	760-1400 (BE)	2136	
400	6-5½x7	286-1800	260-1800	1090.0	5.70	885-1200 (BE)	1950*	
HERCULES								
QXLD	6-3½x4½	91-3200	77-3200	236.7	6.50	189-1400 (BE)	445	
JXE	6-3½x4½	91-3200	77-3200	245.0	6.50	184-1400 (BE)	590	
JXB	6-3½x4½	98-3200	83-3200	263.0	6.50	190-1400 (BE)	605	
JXC	6-3½x4½	103-3200	87.5-3200	282.0	6.50	207-1400 (BE)	605	
JXD	6-4x4½	113-3000	96-3000	320.0	6.50	240-1200 (BE)	605	
JXLD	6-4x4½	131-3200	111-3200	339.0	6.90	272-1400 (BE)	630	
WX-3	6-4½x4½	131-2600	111-2600	383.0	6.60	296-1400 (BE)	820	
WLXC	6-4x4½	123-2600	104-2600	358.0	6.60	275-1200 (BE)	811	
WLXC-3	6-4½x4½	139-2600	118-2600	404.0	6.60	312-1300 (BE)	825	
RXB	6-4½x5½	137-2400	116-2400	501.0	6.50	350-1200 (BE)	1000	
RXC	6-4½x5½	143-2400	121-2400	529.2	6.50	372-1200 (BE)	1010	
TDXB	6-4½x5½	160-2600	136-2600	474.0	6.50	368-1400 (BE)	1345	
RLXC	6-4½x5½	146-2400	124-2400	529.2	6.20	408-1100 (BE)	1195	
RLXD	6-4½x5½	154-2400	131-2400	558.0	6.50	430-1100 (BE)	1195	
RLXLDH	6-4½x5½	180-2600	153-2600	558.0	6.50	443-1400 (BE)	1470	
HXB	6-5x6	159-2000	135-2000	707.0	5.75	502-900 (BE)	1810	
HXC	6-5½x6	175-2000	149-2000	779.0	5.75	555-900 (BE)	1810	
HXD	6-5½x6	202-2000	172-2000	855.0	5.75	645-900 (BE)	1810	
HXE	6-5½x3	227-2000	193-2000	935.0	6.20	750-1000 (BE)	1830	
INTERNAT'L								
GRD-214	6-3½x4½	82.4-3400	73-3200	213.2	6.30	158-1000 (EA)	593*	
GRD-233	6-3½x4½	93-3400	80.2-3400	232.6	6.30	176-800 (EA)	624*	
BLD-260	6-3½x4½	99.8-3200	84-3000	250.5	6.30	194-800 (EA)	875*	
BLD-269	6-3½x4½	100-3000	88.6-2800	269.1	6.30	216-1000 (EA)	874*	
RED-361	6-4½x4½	126-2800	112-2800	360.8	6.30	278-1000 (EA)	1067*	
RED-401	6-4½x5	140-2800	123-2800	400.9	6.30	304-1000 (EA)	1090*	
RED-480	6-4½x5	148-2600	133-2600	451.0	6.30	348-1000 (EA)	1078*	
CONT-R6586	6-4½x5½	200-2600	183-2600	586.6	6.03	462-1000 (EA)	1863	
MACK								
EN-354A†	6-3½x5	121-2700	112-2700	354.0	5.50	260-1400 (EA)	1041	
EN-431A	6-4½x5½	142-2500	123-2500	431.0	6.32	303-1200 (EA)	1580	
EN-471A	6-4½x5½	150-2400	139-2400	471.0	6.12	367-1000 (EA)	1889	
EN-510A	6-4½x5½	158-2400	146-2400	510.0	6.07	379-1000 (EA)	1850	
EN-707A	6-5x6	196-2000	173-2000	707.0	5.85	536-1000 (EA)	1964	
REO								
GC-245	6-3½x4½	89-3100		245.0	6.20	191-1200 (BE)	763*	
GC-288	6-3½x5	96-3000		288.0	6.20	225-1200 (BE)	780*	
GC-310	6-3½x5	101-3000		310.0	6.20	243-1000 (BE)	785*	
WAUKESHA								
190GL	6-3½x4	66-1800		265.0	6.70	210-900 (BE)		
6BZ	6-4x4½	105-3000	89-3000	320.0	5.75	235-1000 (BE)	708	
6MZA	6-4½x4½	128-2800	113-2800	404.0	5.90	290-1000 (BE)	920	
6SRKR	6-4½x5½	129-2250	109-2250	517.0	5.50	369-600 (BE)	1225	
140-GK	6-4½x5½	142-2250	127-2250	525.0	6.00	425-1000 (BE)	1390	
140-GKB(B)	6-4½x5½	176-2800	159-2600	525.0	6.40	435-800 (BE)	1390	
140-GZ(B)	6-4½x5½	188-2600	171-2600	554.0	6.40	460-800 (BE)	1390	
146-GK(A)	6-5½x6	186-2000	172-2000	779.0	6.20	590-1200 (BE)	1810	
146-GKB(B)	6-5½x6	225-2400	207-2400	779.0	6.20	595-1400 (BE)	1810	
145GZ	6-5½x6	220-2000	206-2000	817.0	6.00	615-1200 (BE)	1810	
6WAK	6-6½x6½	235-1800	193-1300	1197.0	5.20	865-900 (BE)	3050	
WHITE								
110A	6-3½x4½	100-3000		270.0	6.21	200-1200 (BE)	1075	
116A	6-3½x4½	110-2800		296.0	6.68	230-1200 (BE)	1075	
120A	6-3½x4½	114-2800		318.0	6.50	250-1200 (BE)	1070	
130A	6-4x4½	120-3000		340.0	6.60	270-1200 (BE)	1075	
140A	6-3½x5½	125-3000		362.0	6.03	285-1400 (BE)	1070	
150A	6-4x5½	135-3000		386.0	6.45	315-1300 (BE)	1070	
260A	6-4½x6	170-2800		451.0	6.25	350-1200 (BE)	1409*	
280A	6-4½x6	184-2800		504.0	6.00	405-1200 (BE)	1442*	
WILLIS								
4-63	4-3½x4½	63-4000		134.2	6.48	105-2000 (BE)	344	
DIESELS								
BUDA								
6-DT-468	6-4½x5½	113-2000	89-2000	468	14.2	268.5-1100	1435	
6-DC-844	6-5½x6½	180-1800	150-1800	844	13.0	460-1100	2850	
6-DCS-844	6-5½x6½	225-1800	185-1800	844		530-1250		
8DC-1125	6-5½x6½	239-1800	197-1800	1125.0	13.0	570-1100		
8DCS-1125	6-5½x6½	300-1800	242-1800	1125.0		700-1250		
CONTINENTAL								
TD-8427	6-4½x4½	112-2400		427	14.5	300-1200	1270	
RD-6572	6-4½x5½	150-2200		572	14.5	400-1200	1785	
CUMMINS								
HB-400	4-4½x6	1100-1800	83-1800	448	17.0	340-800	1930	
HB-600	6-4½x6	1150-1800	125-1800	672	17.0	500-800	2675	
HB-800	6-4½x6	1200-1800	175-1800	672	14.0	625-1400	3000	
NHB-600	6-5½x6	1200-2100	174-2100	743	13.5	575-1400	2675	
NHB-800	6-5½x6	1275-2100	1240-2100	743	13.5	710-1600	3620	
HR-600	6-5½x6	165-1800	141-1800	743	13.5	540-1000	2675	
NVH	12-5½x6	400-2100		1486	15.5		4303*	
NVHS	12-5½x6	550-2100		1486	13.5		4500*	
GEN'L MOTORS								
3-71	3-4½x5	1100-2000		213	16.0	300-1200	1175	
4-71	4-4½x5	1133-2000		284	16.0	400-1200	1300	
6-71	6-4½x5	1200-2000		425	16.0	600-1200	1655	
HERCULES								
DJXB	6-3½x4½	77-2600	66-2600	260	15.0			

TRANSMISSION RATIOS

TRANSMISSIONS MAKE AND MODEL	No. of Forward Speeds	Direct Drive on	GEAR RATIOS							Power Take-off, Opening
			Low	Second	Third	Fourth	Fifth	Reverse	High Reverse	
AUTOCAR										
DF-4, DFU-4	4	4	5.78	3.52	1.83	1.00		7.23		R-L
DF-5, DFU-5	4	4	5.78	3.52	1.83	1.00	.72	7.23		R-L
TF-4, UTF-4	4	4	5.90	3.60	1.84	1.00		7.37		R-L
TF-5, UTF-5	4	4	5.90	3.60	1.84	1.00	.75	7.37		R-L
BROWN-LIPE (1)										
5331	3	3	3.80	1.91	1.00			4.24		R-L
3541	4	4	4.57	2.42	1.73	1.00		4.07		R-L
8241	4	4	6.63	3.19	1.70	1.00		7.53		R-L
8241-A	4	4	7.15	3.44	1.83	1.00		8.13		R-L
8241-B	4	4	4.32	2.57	1.67	1.00		4.90		R-L
6440	4	4	3.80	1.88	1.00	.754		4.43		R-L
7741	4	4	6.27	3.46	1.73	1.00		8.15		R-L
7840	4	4	3.72	2.06	1.00	.77		4.84		R-L
8041	4	4	5.24	2.89	1.71	1.00		6.81		R-L
8045	4	4	6.25	3.47	1.75	1.00		6.39		R-L
8241, 8245	4	4	5.19	2.88	1.72	1.00		6.39		R-L
8440, 8445	4	4	3.67	1.85	1.00	.77		5.31		R-L
4552	5	5	7.92	4.57	2.97	1.66	1.00	6.39		R-L
4552-A	5	5	6.83	4.00	2.31	1.45	1.00	7.34		R-L
4553	5	5	6.10	3.52	1.81	1.00		7.77		R-L
6252	5	5	7.79	4.67	3.06	1.72	1.00	7.81		R-L
6252-A	5	5	6.07	3.41	1.79	1.34	1.00	6.09		R-L
6252-B	5	5	7.79	4.38	2.29	1.45	1.00	7.81		R-L
6253	5	4	6.07	3.41	1.79	1.00		7.81		R-L
7751	5	4	6.27	3.46	1.73	1.00		6.7		R-L
7851	5	4	5.24	2.89	1.71	1.00		6.9		R-L
7851-A	5	4	5.24	2.89	1.71	1.00		7.9		R-L
8051, 8055	5	4	6.25	3.47	1.75	1.00		6.7		R-L
8051-A, 8055-A	5	4	6.25	3.47	1.75	1.00		8.3		R-L
8251, 8255	5	4	5.19	2.88	1.72	1.00		6.9		R-L
8531-Aux.	3	2	2.00	1.00	.72					R-L
8231-Aux.	3	2	2.14	1.00	.69					R-L
703-Aux.	3	2	2.62	1.00	.75					R-L
8031-Aux., 8035-Aux.	3	2	2.89	1.00	.84					R-L
CHEVROLET										
3-Speed	3	3	2.94	1.68	1.00			2.94		No
4-Speed	4	4	7.06	3.58	1.71	1.00		6.78		L
CLARK										
141-T	3	3	3.46	1.71	1.00			4.25		R
170-FS	4	4	6.57	3.58	1.73	1.00		7.88		R-L
ABBREVIATIONS										
(1)—Spicer Mfg. Co.										
(2)—Borg-Warner Corp.										
L—Left side opening.										
R—Right side opening.										
R-L—Right and left side openings.										
(a)—Optional overdrive .76 or .65 to one.										
(b)—Optional second gear 3.27 or 3.08 to one.										
(c)—Optional low reverse 6.49 or 5.06 to one.										
(d)—Right side only on Model 5A-33—Right and left side on 5B-33.										
(e)—Right side only on Model 5A-330—Right and left side on 5B-330.										
(f)—Optional fourth gear 1.38 or 1.69 to one.										



PISTON DISPLACEMENT

Piston Displacement in cu. in. = $B \times B \times .7854 \times S \times \text{No. of Cylinders}$

B = Bore
S = Stroke

.7854 = Constant comprising the conversion of the area of a square to the area of a circle of the same dimensions

MAXIMUM NET ENGINE TORQUE

Torque in lb. ft. = $.70 \times \text{cu. in. Piston Displacement}$. (This is approximate and should be used only when actual torque is not known)
.70 = Average figure based on analysis of a number of torque curves.

VEHICLE SPEED

$$\text{MPH} = \frac{\text{RPM} \times R}{168 \times \text{FGR}}$$

MPH = Miles Per Hour
RPM = Engine Revolutions Per Minute
R = Rolling Radius in Inches
FGR = Final Gear Ratio

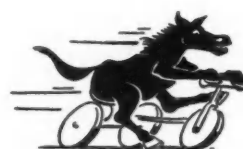
168 = A constant comprising the conversion of rolling radius in inches to wheel circumference in feet; wheel revolutions per minute to wheel revolutions per hour; feet per hour to miles per hour

DRAWBAR PULL

$$\text{DP} = \frac{.90 \times \text{lb. in Torque} \times \text{FGR}}{R} \quad .012 \text{ GVW}$$

DP = Drawbar Pull
R = Rolling Radius in Inches
FGR = Final Gear Ratio
GVW = Gross Vehicle Weight
.90 = Efficiency for all rear axles except worm, then, 85.
lb. in Torque = 12 times Torque in lb. ft.
.012 = 12 lb. per 1000 lb. Rolling Resistance

TRANSPORTATION



HORSEPOWER

Maximum Net Horsepower (maximum gross horsepower less power consumed by engine accessories) is the only horsepower that should be used in transportation engineering formulas, and can be determined only by using a dynamometer or may be procured from the manufacturer

MAXIMUM NET TORQUE

$$\text{Max. Net Torque} = \frac{\text{Torque at Peak HP} \times 5}{4}$$

(This is approximate and should be used only when actual net torque is not known.)
5 and 4 = Figures based on an analysis of a number of torque curves

SELECTION & OPERATION

TRANSMISSIONS MAKE AND MODEL	No. of Forward Speeds	Direct Drive on	GEAR RATIOS							Power Take-off, Opening
			Low	Second	Third	Fourth	Fifth	Reverse	High Reverse	
FULLER										
4A-88, 4A1-88	4	4	6.54	3.27	1.76	1.00		7.24		R-L
4B-88, 4B1-88	4	4	6.55	3.27	1.76	1.00		6.59		R-L
4A-880, 4A1-880	4	4	3.72	1.86	1.00	(a)		4.12		R-L
4A-112	4	4	6.54	(b)	1.76	1.00		(c)		R-L
8A-33, 8B-33	8	5	7.53	4.30	2.52	1.42	1.00	7.37		(d)
8A-330, 8B-330	8	5	6.10	3.48	1.795	1.00		.768 5.96		(e)
8A-43	8	5	8.03	4.61	2.46	1.41	1.00	8.00	4.71	R-L
8A-430	8	5	6.52	3.33	1.77	1.00		.771 6.50	3.33	R-L
8A-62	8	5	8.07	4.67	2.62	1.38	1.00	8.12	4.74	R-L
8A-620	8	5	7.07	3.50	1.72	1.00		.776 7.11	3.55	R-L
8A-65, 8C-65	8	5	8.08	4.67	2.62	(f)	1.00	8.12	4.74	R-L
8A-650, 8C-650	8	5	6.37	3.40	1.74	1.00		.788 6.40	3.35	R-L
8A-920, 8A-1120	10(g)	9	6.54	3.27	1.76	1.00		.744 6.49		R-L
10B-920, 10B-1120	10(h)	9	15.04	7.52	6.54	4.05	3.27	(g)	(g)	R-L
4AM-88	4	4	6.54	3.27	1.76	1.00		7.24		R-L
4BM-88	4	4	6.55	3.27	1.76	1.00		6.59		R-L
4AM-880	4	4	3.72	1.86	1.00	.76		4.12		R-L
8M-33	8	5	7.53	4.30	2.52	1.00		7.37		R-L
8M-330	8	5	6.10	3.48	1.795	1.00		.768 5.96		R-L
8M-43	8	5	8.03	4.61	2.46	1.41	1.00	8.00	4.71	R-L
8M-430	8	5	6.52	3.33	1.77	1.00		.771 6.50	3.33	R-L
8M-62	8	5	8.07	4.67	2.62	1.38	1.00	8.12	4.74	R-L
8M-620	8	5	7.07	3.50	1.72	1.00		.776 7.11	3.55	R-L
8M-920	8	5	6.54	3.08	1.76	1.00	6.36	6.49		R-L
AR-Aux.	1	1	1.00					1.00		
AR-1.63 Aux.	2	1	1.63	1.00						
2B-62 Aux.	2	1	(n)	1.00						
2B-82 Aux.	2	1	1.33	1.00						
2A-92 Aux.	2	1	2.298	1.00						
2B-92 Aux.	2	1	1.313	1.00						
2A-65 Aux.	3	1	2.221	1.00	.754					R
2B-65 Aux.	3	1	1.239	1.00	.804					R
2A-82 Aux.	3	1	2.09	1.00	.754					R
2B-82 Aux.	3	1	1.235	1.00	.836					R
3T-82 Aux.	3	1	2.09	1.00	.754					(k)
INTERNATIONAL										
HDS-B	3	3	3.053	1.481	1.00			3.707		No
H41-B	4	4	6.40	3.09	1.69	1.00		7.82		R
WT-97-WT-97A	4	4	6.398	3.092	1.686	1.00		7.82		R
F-51	5	4	6.52	3.72	1.92	1.00		.823 6.38		R-L
F-51C	5	5	7.35	4.30	2.52	1.42	1.00	7.20		R-L
F-52	5	4	6.98	3.67	1.89	1.00		.825 6.38		R-L
F-52C	5	5	8.03	4.61	2.46	1.41	1.00	8.00		R-L
F-54	5	5	7.07	3.50	1.72	1.00		.776 7.11		R-L
F-54B-F-55B	5	5	8.08	4.67	2.62	1.38	1.00	(m)		R-L
F-55	5	5	8.37	3.404	1.738	1.00		.788 6.40		R-L
F-55C	5	5	8.08	4.67	2.62	1.38	1.00	8.12		R-L
STUDEBAKER										
673579	3	3	3.34	1.85	1.00			4.53		R-L
673519	4	4	3.34	1.85	1.00	.700		4.53		R-L
676044-678794	4	4	6.40	3.09	1.69	1.00		7.82		R
678790	4	4	5.90	3.09	1.69	1.00		7.21		R
WARNER										
T9	4	4	6.40	3.09	1.69	1.00		7.82		R
T9A	4	4	5.901	3.09	1.69	1.00		7.213		R
T9B	4	4	6.40	3.09	2.21	1.00		7.82		R
T9C	4	4	6.40	4.07	2.89	1.00		7.82		R
T87D	3	3	3.714	1.871	1.00			4.888		No
T90A-T90C	3	3	2.798	1.551	1.00			3.798		No
T90B	3	3	3.34	1.85	1.00			4.531		No
T90D	3	3	3.339	1.851	1.00			4.531		No
T90E	3	3	3.34	1.851	1.00			4.531		No
T97	4	4	6.398	3.092	1.686	1.00		7.820		R
WATSON										
41-Aux.	2	2	1.26	1.00	.830					Yes
42-Aux.	2	2	1.49	1.00	.830					Yes
43-Aux.	2	2	2.11	1.00	.830					Yes
44-Aux.	2	2	1.26	1.00	.750					Yes
45-Aux.	2	2	1.49	1.00	.750					Yes
46-Aux.	2	2	2.11	1.00	.750					No
47-Aux.	3	3	1.49	1.20	1.00					No
48-Aux.	3	3	2.11	1.20	1.00					No
WHITE										
424B	4	4	6.35	3.31	1.73	1.00		7.64		R
418B	4	4	6.35	3.38	1.73	1.00		7.41		R-L
502B	5	5	7.58	4.38	2.40	1.48	1.00	7.51		R-L
502B	5	5	6.06	3.50	1.91	1.00		.769		R-L
501B	5	5	7.88	4.46	2.63	1.48	1.00	7.88		R-L
551B	5	5	7.00	3.97	1.90	1.00		1.768		R-L
507B	5	5	7.88	4.41	2.63	1.48	1.00	7.88		R-L
506B	5	5	7.00	3.93	1.90	1.00		1.768		R-L
556B	5	5	8.08	4.67	2.62	1.38	1.00	8.12		R-L
	5	4	6.37	3.40	1.74	1.00		.788		6.40 R-L

(g)—Ratios beyond fifth gear as follows:
6th, 2.30; 7th, 1.76; 8th, 1.462 or 1.711; 9th, 1.00; 10th, 6.36
or .744; Low Rev., 14.93 or 11.64; High Rev., 6.49 or 5.06.

(h)—Ratios beyond fifth gear as follows:
6th, 1.76; 7th, 1.31; 8th, 1.00; 9th, .835 or .976; 10th, .636
or .744; Low Rev., 8.52 or 6.64; High Rev., 6.49 or 5.06.

(k)—Front or Rear—Full Torque.
(m)—8.12 and 4.74.
(n)—1.58 or 2.00.

ENGINEERING FORMULAS

TORQUE AT PEAK
HORSEPOWER

$$\text{Torque at Peak HP} = \frac{\text{HP} \times 5252}{\text{RPM}}$$
 5252 = Constant resulting from the conversion of
torque and RPM into horsepower
HP = Maximum net horsepower (See Horsepower
formula)
Peak HP = Maximum useful horsepower



AIR RESISTANCE

Air Resistance = .0025 × (MPH)² × FA
 FA = Frontal area of equipment in sq. ft.
 MPH = Miles Per Hour

FINAL GEAR RATIO

$$\text{FGR} = \frac{R \times \text{GVW} \times (\text{GA} + .012)}{\text{lb. in. Torque} \times .90}$$

GA = Grade Ability
 GVW = Gross Vehicle Weight
 lb. in. Torque = 12 × lb. ft. Torque
 R = Rolling Radius in Inches
 .90 = Efficiency for all rear axles except worm,
 then .85
 .012 = Rolling resistance on hard-surfaced roads

GRADE ABILITY

$$\text{GA} = \frac{\text{TE}}{\text{GVW}} - \text{minus .012}$$

GA = Grade Ability
 TE = Tractive Effort
 GVW = Gross Vehicle Weight
 .012 = 12 lb. per 1000 lb., rolling resistance on
 hard-surfaced roads



TRACTION EFFORT

$$\text{TE} = \frac{\text{lb. in. Torque} \times \text{FGR} \times .90}{R}$$

R = Rolling Radius in Inches
 FGR = Final Gear Ratio
 lb. in. Torque = 12 times Torque in lb. ft.
 .90 = Efficiency for all rear axles except worm
 then .85

AMA HORSEPOWER

(For License Purposes Only)
B × B × No. of Cyl.

$$\text{AMA HP} = \frac{2.5}{B}$$

B = Cylinder Bore
 2.5 = Constant based on average engine in 1908

Bad Driving Practices

While tangible driver mistakes continue to take a harrowing toll on the nation's highways, many accidents are caused by intangibles.

Here are some of the most interesting, direct from the ICC's files.

THE SUBJECT of driving habits covers a wide range of factors, tangible and intangible. Violations of rules and regulations, directly or indirectly causative of accidents in many instances, can be traced to bad driving habits. On the other hand, our records indicate that even those drivers who religiously abide by the Motor Carrier Safety regulations are involved in numerous accidents largely because they failed to operate their vehicles in a practical manner and with good sense.

Many of the existing faults are among the most common driver failures and are not new, but have been plaguing safety officials since the arrival of the automotive vehicle on the American scene. They still rank high as a source of trouble. Several of them are listed in the box on opposite page.

Our files also reveal that many serious accidents are caused by driver faults or failures which are comparatively intangible or at least not clearly distinguishable at the time of the accident.

Driver "Blacks Out"

LET me illustrate with a few incidents which have come to my attention. Recently, a driver was assisting in the loading of his trailer when a heavy piece of freight slipped and struck him a severe blow on the head. There was intense pain for a brief time, but when this had passed the driver went about his work and soon had practically forgotten the incident. When an hour and a half out



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Director, Section of Safety
Bureau of Motor Carriers
Interstate Commerce Commission

on the highway, this driver "blacked out." His vehicle left the roadway, started up an embankment, and overturned. A doctor later advised that the blow had caused a brain concussion which caused subsequent loss of consciousness. Drivers should be placed on guard against driving following any experience which might render them unable to do so in safety, having particularly in mind the possible delayed effects of head injuries.

Insulin Shock

ANOTHER accident remained unexplained for a time after its occurrence. A tractor-semi-trailer went out of control while proceeding slowly down a suburban street. It sideswiped a street car, then sideswiped several cars parked at the curb, and finally came to rest a half block farther on, against a pole. The driver reported only that he "blacked out." It was later learned from the hospital

where he was taken that the man had suffered insulin shock. He then admitted that he had been taking insulin for diabetes since he was eight years old. For more than a year he had continued the dosage last prescribed without any check by a physician. There was a certificate of fitness signed by a physician for this driver. This certificate, it would appear, had been issued on the basis of an inadequate examination. The wise motor carrier will make every effort to have his drivers undergo a periodic examination which will reveal any significant physical defect or deficiency.

Climatic Conditions

OUR records also reveal that there are many instances where alert drivers are quick to recognize changing conditions but for some unknown reason do not sufficiently compensate for such conditions in the operation of their vehicles. This is particularly true in regard to changing road or climatic conditions. Again, perhaps, the best way to illustrate this point is to present a few examples from our files:

The driver of a tractor-semi-trailer unit entered an area of fog, reducing the speed of his motor vehicle to approximately 15 mph because of poor visibility. The driver of a tractor-semi-trailer following entered the same area at a speed approximated to be 30 to 35 mph. This second vehicle struck the rear end of the first, fire began almost immediately, three other tractor-semi-trailer units crashed into

the wreckage, resulting in one driver being fatally burned, two others injured, the total destruction of several units and their cargo. The drivers involved in the cited instances could not fail to recognize the changing conditions, but did not properly compensate for them.

The driver of a bus on a regular schedule had encountered fog and icy roadway conditions for quite some distance, overtook and endeavored to pass another vehicle traveling in the same direction at a speed approximated to be 50 mph. Visibility at the time was about 400 ft, the roadway was slick, when about abreast of the vehicle it was passing, the bus driver suddenly noticed another bus approaching from the opposite direction. Realizing that a sudden application of the brakes would cause a skid, the driver of the overtaking bus in trying to avoid the collision drove his vehicle to the left in an attempt to reach the left shoulder of the highway. Fire ensued at the time of the collision, resulting in 12 persons being fatally burned and many thousands of dollars in property damage.

Improper Rest

DRIVING habits which result in violation of the Hours of Service regulations are also direct causes of many serious accidents. There are many instances which serve clearly to illustrate that drivers will push themselves beyond the point where their mental processes are as acute as is necessary for safe operation of modern vehicles.

For example, drivers are often prone to start out on runs which will take more than one day to complete without any idea where they will stop for the night. In other words, **nothing is done to plan a trip ahead** so that they will be sure of ending their day's driving in a town or city where accommodations can be obtained for the night. This often results in drivers finding themselves an hour or two away from such a location and they violate the Hours of Service regulations by continuing on. An example of the results of this type of carelessness is a case in Illinois where the driver was unable to find accommodations at the end of his 10 hours

Primary Bad Driving Practices

Tangible

Insisting on the right of way



Passing a "Stop" sign

Counting on the "other guy"



Driving too close to vehicle ahead

Driving left to avoid collision



Too fast in bad weather

Intangible

Mental fatigue—emotional strain



"Black out" from head injury

Failure to detect mechanical faults



Improper rest—poor sleep

Improper breakdown procedure



"Black out" from Insulin Shock

of driving. Intending to drive an additional 75 miles, he got into an accident after having driven only 54 miles, killing himself and two innocent people.

Another bad practice is improper use of rigs equipped with sleeper berths. When this is done by a single driver, he will often stop and curl upon the seat of the cab instead of getting into the berth, thus failing to avail himself of the best facilities at hand and showing himself "off duty" in a sleeper berth thereby falsifying his driver's log. Nothing is saved by this procedure and much can be lost due to prosecution and accidents which result from accumulated fatigue which is not relieved by sleeping in a cramped position. Recently, a driver who did such a thing died because he left the motor running; and this is by no means an isolated instance. A defective exhaust system caused carbon monoxide suffocation. Had he used the sleeper berth with adequate bed clothing, he would not have needed the additional warmth provided by the engine heat. This also applies in the case of two drivers operating a sleeper berth rig where the drivers rest sitting on the seat instead of using the berth. An accident which occurred in the latter part of last year in Colorado, resulted in a fatal accident killing one of the two drivers. Investigation disclosed that these men had alternated at the wheel from Oklahoma to the point of the accident without either being in the berth at any time.

Mental Fatigue

MENTAL FATIGUE or "lack of awareness" induced by emotional stress also results in serious accidents. Drivers persist in doing so, and carriers permit drivers to take out runs when both know the driver is suffering from severe mental strain caused by family and/or domestic problems. Fatigue is almost invariably the end result followed by an accident. Accident data are at hand in which catastrophic results flow directly from drivers having been engaged in marital difficulties, infidelities, quarrels, money problems, etc. Specific cases are omitted by reason of possible identi-

(TURN TO PAGE 262, PLEASE)



STATE SIZE and W

STATE	SIZE RESTRICTIONS (K)							GROSS WEIGHT		PRACTICAL GROSS WEIGHT LIMITS (K)														
	Width (Inches)	Height (Feet)	LENGTH			Minimum Tandem Axle Spacing	Per Inch of Tire Width	Per Axle (1000 lb.)	(Where No Distinction is Made Between Pneumatic and Solid Tire Limits, Below Limits Apply to Both)															
			Single Unit	Tractor Semi-Trailer	Other Combinations				Number of Trailers (Semi-Trailer=1/2)	(LEGAL LIMITS)	4-Wheel Single Unit	6-Wheel Single Unit	4-Wheel Tractor 2-Wheel Semi-T.	4-Wheel Tractor 4-Wheel Semi-T.	6-Wheel Tractor 4-Wheel Semi-T.	4-Wheel Truck Trailer	4-Wheel Truck Trailer	6-Wheel Truck Trailer	6-Wheel Truck Trailer	4-Wheel Tractor 2-Wheel Semi-T.	4-Wheel Tractor 4-Wheel Semi-T.	6-Wheel Tractor 4-Wheel Semi-T.	4-Wheel Tractor 2-Wheel Semi-T.	4-Wheel Tractor 4-Wheel Semi-T.
Ala. TVX	96	12½	35	45	NP	½	NS	600	18-I	36	46.9	53.9	53.9	53.9	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
Ariz.	102	13½	35	65	65	1½	NS	700	18	36	53.6	54	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6	77.6
Ark. VX	96	12½	35	50	60	1 or ½	48	NS	18	36	50	54	64.6	64.6	72	73.2	73.2	73.2	NP	NP	NP	NP	NP	NP
Cal. X	96	13½	35	60	60	NR	NS	NS-P 600-S	18	36	54	54	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6
Colo.	96 102 b	12½	35	60	60	2	40	NS-P 500-S	18-I 16-J	30	46	54	72	73.6	72	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6	73.6
Conn. TZ	102	12½	45	45	NP	½	NS	NS-P 800-S	NS(Z)	32	50	50	50	50	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
Del. Z	96	12½	35	50	60	1½	NS	700	20	30c	40c	46c	60c	60c	60c	60c	60c	60c	60c	60c	60c	60c	60c	60c
D. C. VZ	106 a 96	12½	35	50	50	1 or ½	40	NS	22	44	65.4	65.4	65.4	65.4	65.4	65.4	65.4	65.4	NP	NP	NP	NP	NP	NP
Fla.	96	12½	35	50	50	1 or ½	NS	550	18-Q	24	40	40	60	60	60	60	60	60	NP	NP	NP	NP	NP	NP
Ga. X	96	13½	35	45	45	1 or ½	40	NS	18-I 16-J	36	46.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9
Idaho V	96	14	35	60	65	1½	NS	800	18	28	42	42	56	60	56	68	68	68	68	68	68	68	68	68
Ill. TV½	96	NS	42	45	45	1½	40	800	18	36	41	45	59	59	63	63	72	72	72	72	72	72	72	72
Indiana	96	12½	36	50	50	1½	40	800	22.4-R	44.8-R	58.4	67.2	70	70	72	72	72	72	72	72	72	72	72	72
Iowa TX	96	12½	35	45	NP	½	40	NS	18 17	36	50	54	60.8	60.8	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
Kansas X	96	12½	35	45	45	1 or ½	40	NS	18-I 16-J	24 28	34	53.9	53.9	53.9	48	58	58	63	NP	NP	NP	NP	NP	NP
Ky. T	96	12½	35	45	NP	½	NS	600	18	30	42	42	42	42	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
La.	96	12½	35	50	60	1 or ½	40	NS	18-I 16-J	18	36	36	50	64	54	NP	68	NP	NP	NP	NP	NP	NP	NP
Maine	96	12½	45h	45h	45h	1 or ½	NS	800	22-G	32	50	50	50	50	50	50	50	50	NP	NP	NP	NP	NP	NP
Md. X	96	NR	55	55	55	NR	NS	600	22.4 18-a	44.8	58.4	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2	65.2
Mass.	96 102 b	NR	35	45	NS	1 or ½	NS	800	NR	36	50	50	50	50	37	37	51	51	NP	NP	NP	NP	NP	NP
Mich. P	96 102 b	12½	35	50	50	1½	NS	Table	18-P 16-S	36-PW 32-S	44-PW 39.2-S	54-PW 48-S	62-PW 55.2-S	70-PW 62.4-S	72-PW 64-S	80-PW 71.2-S	80-PW 71.2-S	88-PW 78.4-S	90-PW 80-S	98-PW 87.2-S	114-PW 101.4-S			
Minn. TX	96	12½	40	45	45	1 or ½	NS	NR	18-P 10.8-S	36	46.9 32.4	54 32.4	57.7 34.6	57.7 34.6	57.7 34.6	57.7 34.6	57.7 34.6	57.7 34.6	NP	NP	NP	NP	NP	NP
Miss.	96	12½	35	45	45	1 or ½	40	NS	18-I 16-J	27	37.6	45	52.6	52.6	52.6	52.6	52.6	52.6	52.6	NP	NP	NP	NP	NP
Mo. ZX	96	12½	35	45	45	NR	NS	600	18	36	46.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	53.9	NP	NP	NP	NP	NP
Mont. XV	96	13½	35	60	60	1 or ½	NS	NS	18	36	50	54	68	73.2	72	73.2	73.2	73.2	73.2	NP	NP	NP	NP	NP
Neb. TX	96	12½	35	50	50	1½	NS	NS	18	36	50	54	62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3	62.3
Nev.	NR	NR	NR	NR	NR	NR	42	600	18	36	48.8	54	66.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8	76.8
N. H.	96	NR	35	45	45	NR	NS	800	18	30	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5	47.5
N. J.	96	12½	35	45	50	1 or ½	NS	Table	Table	30	40	60	60	60	60	60	60	60	NP	NP	NP	NP	NP	NP
N. M. V½	96 100 b	12½	40	65	65	1 or ½	40	700-P 500-S	18	36	50.2	54	69	69	69	69	69	69	NP	NP	NP	NP	NP	NP
N. Y. X	96 106 b	13	35	50	50	1 or ½	46	800-P 640-S	22.4-P 17.9-S	36-P 28.8-S	44-P 35.2-S	54-P 49.2-S	61.5-P 49.2-S	61.5-P 49.2-S	61.5-P 49.2-S	61.5-P 49.2-S	61.5-P 49.2-S	61.5-P 49.2-S	NP	NP	NP	NP	NP	NP
N. C.	96	12½	35	48i	48i	1 or ½	48	600	18-I 16-J	26-L	40	40	50	50	50	50	50	50	NP	NP	NP	NP	NP	NP
N. D. TX	96	12½	35	45	45	1 or ½	40	550	18 14-f	36	50.2	54	57.7	57.7	57.7	57.7	57.7	57.7	NP	NP	NP	NP	NP	NP
Ohio X	96	12½	35	45	60	NR	NS	650	18-P 16-S	36-P 32-S	50.2-P 40.2-S	54-P 50.2-S	63.7-P 50.2-S	63.7-P 50.2-S	72-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S	75-P 59.2-S

WEIGHT LIMITS



SELECTION & OPERATION

Corrected to March 15, 1949

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STATE	SIZE RESTRICTIONS (K)						GROSS WEIGHT		(See Boxed NOTE)	PRACTICAL GROSS WEIGHT LIMITS (K)												(In thousands of pounds)	
	Width (Inches)	Height (Feet)	LENGTH			Minimum Tandem Axle Spacing	(LEGAL LIMITS)		(Where No Distinction is Made Between Pneumatic and Solid Tire Limits, Below Limits Apply to Both)														
			Single Unit	Tractor Semi-Trailer	Other Combinations		Number of Trailers (Semi-Trailer=½)	Per Inch of Tire Width	Per Axle (1000 lbs.)	4-Wheel Single Unit	6-Wheel Single Unit	4-Wheel Tractor 2-Wheel Semi-T.	4-Wheel Tractor 4-Wheel Semi-T.	6-Wheel Tractor 4-Wheel Semi-T.	4-Wheel Truck 4-Wheel Trailer	4-Wheel Truck 6-Wheel Trailer	6-Wheel Truck 4-Wheel Trailer	6-Wheel Truck 6-Wheel Trailer	4-Wheel Tractor 2-Wheel Semi-T. 4-Wheel Trailer	4-Wheel Tractor 4-Wheel Semi-T. 4-Wheel Trailer			6-Wheel Tractor 4-Wheel Semi-T. 6-Wheel Trailer
Okla.	96	12½	35	50	50	1½	NS	600	18	36	50	54	60	60	60	60	60	60	60	60	60	60	60
VXZ Ore.	96	12½	35	60	60	NR	40	600 ^q	18 ^w 16 ^x	36	54 ^H	54 ^H	54	60	60	60	60	60	60	60	60	60	60
Pa.	96	12½	33	45	50	1 or ½	36	800	20	30 ^H	40 ^H	45	45	45	56	62	62	62	NP	NP	NP	NP	NP
R. I.	102	12½	35	45	45	1 or ½	NS	800	22.4	32-P 28-S	44	50	50	50	64-P 56-S	72-P 68-S	72-P 68-S	80	NP	NP	NP	NP	NP
X S. C.	96	12½	40	50	50	1 or ½	40	NR	20-I 16-J	40	52	60	68.3	68.3	68.3	68.3	68.3	68.3	NP	NP	NP	NP	NP
X S. D.	96	13	35 K	50	50	1 or ½	40	600	18-I 16-J	36	50	54	64.6	64.6	64.6	64.6	64.6	64.6	NP	NP	NP	NP	NP
Tenn.	96	12½	35	45	45	1 or ½	40	NS	18	36	42	42	42	42	42	42	42	42	NP	NP	NP	NP	NP
X Tex.	96	12½	35	45	45	1 or ½	40	850-I 600-J	18-I 16-J	36	48	48	48	48	48	48	48	48	NP	NP	NP	NP	NP
XZ Utah	96	14	45	60	60	2	NS	800 ^o	18-P 13.5-S	36	51	54	69	79.9	72	79.9	79.9	79.9	79.9	79.9	79.9	79.9	79.9
Z Vt.	96	12½	50	50	50	1 or ½	40	600	NR	30 M 16	40 M 16	50 M 16	50 M 16	50 M 16	50 M 16	50 M 16	50 M 16	50 M 16	NP	NP	NP	NP	NP
VZ Va.	96	12½	33 ^g	45	45	1 or ½	40	650	18	32	40	40	50	50	50	50	50	50	NP	NP	NP	NP	NP
X Wash.	96	12½	35	60	60	1 or ½	NS	500	18	26	36	54	58	68	58	58	62	68	NP	NP	NP	NP	NP
WVXZ W. Va.	96	12½	35	45	45	NR	40	NS	18-PB 14-SB	36-PWB 28-SB	54-PWB 42-SB	54-PWB 42-SB	72-PWB 56-SB	90-PWB 70-SB	72-PWB 56-SB	90-PWB 70-SB	90-PWB 70-SB	102.4PB 81.9-SB	90-PWB 70-SB	102.4PB 81.9-SB	102.4PB 81.9-SB	102.4PB 81.9-SB	
V Wis.	96 d	12½	35	45	45	1 or ½	40	800	18-C 12-D	30-Ck 15-D	54-C 32-D	54-C 38-D	63-C 38-D	63-C 38-D	63-C 38-D	63-C 38-D	63-C 38-D	63-C 38-D	NP	NP	NP	NP	NP
X Wyo.	96	12½	40	60	60	2	NS	800	18-I 16-J	36	50	54	64	73.9	72	73.9	73.9	73.9	73.9	73.9	73.9	73.9	73.9

NOTE ON "W" AND SHADED SQUARES

Except when shown in squares shaded with parallel lines or when followed by the letter "W," the above gross weight limits are the limits fixed by state law.

When shown in shaded squares the above limits are computations made by the National Highway Users Conference to show what it considers to be practical gross weights where gross weights are arrived at by application of one of the formulae shown below under Footnote "X." In making these computations, wheel base was arrived at by deducting 8 ft. total overhang front and rear from permissible overall length of unit or combination; tandem axles were considered to be a minimum permissible distance apart; H-20 bridge formula was used in West Virginia. When actual overhang is less than 8 ft. additional gross weight will be possible.

When followed by the letter "W," the limits shown are maximum possible weights where gross weight is determined by permissible axle weight. These limits are possible only when each axle carries a gross weight equal to the permissible axle limit as shown.

H—Maximum shown gross depends on chassis weight.

I—Permissible on balloon tires.

J—Permissible on other than balloon tires.

K—May exceed on designated highways with permit.

L—Buses permitted 22,500 maximum net weight.

M—On State highways.

N—40,000 lb. with pneumatic tires, 3 axles, 2 hubs and brakes on each hub.

Q—If equipped with power brakes.

R—On designated heavy-duty highways. On other highways axle limit is 18,000 lb.

T—With the following exceptions full trailers are permitted the same gross weight as other single units:—

Ala., Iowa, Conn., Ky.—Full trailers prohibited.

Ill.—All trailers limited to 32,000 lb gross.

Mass.—Trailers limited to 1,000 lb capacity.

Nebr.—All trailers limited to 16,000 lb gross.

Weight of trailers is limited by axle limitations and formula, in states determining gross weight by formula.

V—Solid tires prohibited.

V1—Solid tires prohibited except on property carrying vehicles operating at 10 miles per hour or less.

V2—Solid tires limited to 20 miles per hour under 10,000 lb and to 12 miles per hour over 10,000 lb.

W—See Note above.

W1—Maximum gross when all axles carry maximum load—See "Note."

X—States where gross weight is determined by formula. (See State under "Bridge Formulas" in next column and formula computations on next page).

Z—See "Restrictions Peculiar to Certain States" on next page.

BRIDGE FORMULAS

Ala.—700 (L plus 40) on any unit or combination.

Ariz.—800 (L plus 40) new vehicles; 850 (L plus 40) vehicles registered before June 9, 1945, until January 1, 1955; 700 (L plus 40) new vehicles with axle spacing 18

ft or less; 750 (L plus 40) vehicles registered before June 9, 1945, until January 1, 1955, axle spacing between 14 and 18 ft.

Ark.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 73,280 lb if spacing is 57 ft or more.

Calif.—Gross weights graduated from 30,100 lb if axle spacing is 3 ft to 76,800 lb if spacing is 56 ft or more.

Colo.—800 (L plus 40).

Del.—Gross weights graduated from 36,000 lb if axle spacing is 4 ft to 60,000 lb if spacing is 39 ft or more.

D. C.—Gross weights graduated from 38,000 lb if axle spacing is 4 ft to 65,400 lb if spacing is 46 ft or more.

Ga.—Same as Ala.

Iowa.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 60,000 lb if spacing is 40 ft or more.

Kans.—700 (L plus 40) only applies to combinations.

Maine.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 50,000 lb if spacing is 27 ft or more.

Md.—750 (L plus 40) any unit or combination.

Minn.—750 (L plus 40).

Miss.—Gross weights graduated from 28,650 lb if axle spacing is 4 ft to 52,650 lb if spacing is 30 ft or more.

Mont.—Same as Ark.

Nebr.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 64,650 lb if spacing is 45 ft or more.

Nev.—Same as Calif.

N. M.—750 (L plus 40) two or more consecutive axles and any unit or combination.

N. Y.—750 (L plus 40) three or more consecutive axles and any unit or combination.

N. Dak.—750 (L plus 40) any unit or combination.

Ohio.—750 (L plus 40) 3 or more axles.

Okla.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 60,000 lb if spacing is 39 ft or more.

Ore.—Same as Ala.

S. C.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 63,350 lb if axle spacing is 50 ft or more.

S. D.—Same as Nebr.

Tenn.—Same as Ala.

Texas.—Same as Ala.

Utah.—Gross weights graduated from 33,000 lb if axle spacing is 4 ft to 79,990 lb if spacing is 54 ft or more.

Wash.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 72,000 lb if spacing is 57 ft or more.

W. Va.—1330-1000-670 (L plus 40) apply to highways dependent on bridge types thereon.

Wyo.—Gross weights graduated from 32,000 lb if axle spacing is 4 ft to 73,950 lb if spacing is 57 ft or more.

Italic figures denotes limit now effective by proclamation or order of the Governor or other State Official.

See Note at right.

—If registered before 1932.

—At rear tires, when solids changed to pneumatics.

—With power brakes.

—104 in. for urban buses.

—If less than 50 in. apart.

—If less than 8 ft apart.

—Buses allowed 35 ft length.

—Trailers are limited to 26 ft.

—Buses permitted 40 ft.

—Graduated according to tire width.

—13,000 lb on tandem axles 3 ft 6 in. apart; applies June 1 to February 28; differs with season.

—500 lb when total tires under 30 in. wide.

—Dual tires 8 in. wide or over.

—Permissible weight on paved highways.

—Permissible weight on unpaved highways.

—City of Clinton, Ill., limits truck gross weight to 12,000 lb.

Table—There is a table of axle weights based upon tire widths.

NP—Not permitted.

NR—No restriction.

NS—Not specified.

P—Pneumatic tires.

PL—Pay load.

S—Solid tires.

—In "Industrial Areas"—varies for different "areas."

—Permissible on "Class A" highways.

—Permissible on "Class B" highways.

—Axles less than 10 ft apart limited to 16,000 lb.

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The Conference also publishes state restrictions on sizes and weights in detailed, diagrammatic, loose-leaf form.



GROSS WEIGHTS COMPUTED BY FORMULAS

Computation of Gross Weights according to formulas, based on distance (in feet) between first and last axles, for States identified by State Size & Weight Limits chart by Footnote "X." It should be remembered that the figures in each column represent only a mathematical extension and are governed by Legal Overall Length Limits for single units and combinations of particular states. Also, that formula computations are superseded in some instances by specific limits given in the chart.

"L" (See Note Below)	Minnesota ¹	West Virginia (H-10 Bridges)	Ala., Ariz., ² Georgia, Kansas, N. Car., Tenn., Texas	Ariz., ³ Md., Minn., N. Mex., N. Y., Ore.	West Virginia (H-15 Bridges)	West Virginia (H-20 Bridges)	Colorado, Arizona	Arizona	"L" (See Note Below)
	650 (L + 40)	670 (L + 40)	700 (L + 40)	750 (L + 40)	1000 (L + 40)	1330 (L + 40)	800 (L + 40)	850 (L + 40)	
10 ft.	32500 lb.	33500 lb.	35000 lb.	37500 lb.	50000 lb.	66500 lb.	..... lb.	..... lb.	10 ft.
11	33150	34170	35700	38250	51000	67830	.....	.....	11
12	33800	34840	36400	39000	52000	69160	.....	.....	12
13	34450	35510	37100	39750	53000	70490	.....	.....	13
14	35100	36180	37800	40500	54000	71820	43200	.....	14
15	35750	36850	38500	41250	55000	73150	44000	.....	15
16	36400	37520	39200	42000	56000	74480	44800	.....	16
17	37050	38190	39900	42750	57000	75810	45600	.....	17
18	37700	38860	40600	43500	58000	77140	46400	.....	18
19	38350	39530	41300	44250	59000	78470	47200	.....	19
20	39000	40200	42000	45000	60000	79800	48000	.....	20
21	39650	40870	42700	45750	61000	81130	48800	.....	21
22	40300	41540	43400	46500	62000	82460	49600	.....	22
23	40950	42210	44100	47250	63000	83790	50400	.....	23
24	41600	42880	44800	48000	64000	85120	51200	.....	24
25	42250	43550	45500	48750	65000	86450	52000	55250	25
26	42900	44220	46200	49500	66000	87780	52800	56100	26
27	43550	44890	46900	50250	67000	89110	53600	56950	27
28	44200	45560	47600	51000	68000	90440	54400	57800	28
29	44850	46230	48300	51750	69000	91770	55200	58650	29
30	45500	46900	49000	52500	70000	93100	56000	59500	30
31	46150	47570	49700	53250	71000	94430	56800	60350	31
32	46800	48240	50400	54000	72000	95760	57600	61200	32
33	47450	48910	51100	54750	73000	97090	58400	62050	33
34	48100	49580	51800	55500	74000	98420	59200	62900	34
35	48750	50250	52500	56250	75000	99750	60000	63750	35
36	49400	50920	53200	57000	76000	101080	60800	64600	36
37	50050	51590	53900	57750	77000	102410	61600	65450	37
38	50700	52260	54600	58500	78000	103740	62400	66300	38
39	51350	52930	55300	59250	79000	105070	63200	67150	39
40	52000	53600	56000	60000	80000	106400	64000	.....	40
41	52650	54270	56700	60750	81000	107730	64800	.....	41
42	53300	54940	57400	61500	82000	109060	65600	.....	42
43	53950	55610	58100	62250	83000	110390	66400	.....	43
44	54600	56280	58800	63000	84000	111720	67200	.....	44
45	55250	56950	59500	63750	85000	113050	68000	.....	45
46	55900	.....	60200	64500	.....	.....	68800	.....	46
47	56550	.....	60900	65250	.....	.....	69600	.....	47
48	57200	.....	61600	66000	.....	.....	70400	.....	48
49	57850	.....	62300	66750	.....	.....	71200	.....	49
50	58500	.....	63000*	67500	.....	.....	72000	.....	50
51	59150	.....	63700	68250	.....	.....	72800	.....	51
52	59800	.....	64400	69000	.....	.....	73600	.....	52
53	60450	.....	65100	69750	.....	.....	74400	.....	53
54	61100	.....	65800	70600	.....	.....	75200	.....	54

"L"—distance in feet between first and last axles of group of axles considered.

1.—Vehicles with axles spaced 18 feet or less.

2.—In Arizona this applies (up to 18 feet) to any two or more axles on any vehicle or combination which was first registered on or after June 9, 1945.

3.—This applies in Arizona to any vehicle or combination which was first registered prior to June 9, 1945 having a group of two or more axles, where the distance between the first and last axles of the group is between 14 and 18 feet, inclusive.

4.—This applies to any vehicle or combination first registered prior to June 9, 1945 where the total wheel base is between 25 and 45 feet, inclusive.

RESTRICTIONS PECULIAR TO CERTAIN STATES

D. C. Solid tires, when permitted, allowed 10 per cent less than pneumatics.

VT. The greatest allowances shown in State Size & Weight Limit chart are permitted on state highways, medium allowances are the maxima permitted on state-aid highways, and the lowest allowances are the maxima permitted on other highways.

VA. Two-axled vehicles with six-wheels permitted 32,000 lbs. gross.

W. VA. No unit may carry a load more than 100 per cent greater than its registered capacity if registered for not over two tons; or more than 50 per cent greater if registered for over two but not over four tons; or more than 25 per cent greater if registered for over four tons.



PILOT STUDY

Truck Performance Data

Time and Fuel Consumption comparisons for trucks and combinations on various Grades and Highways show how terrain affects operating costs

FLEET OPERATORS have long known that the type of terrain over which a truck operates has a direct bearing on the cost of operation. But most have accepted it as simple logic, and only a few have taken the time and trouble to prove it. Now we have proof that all operators will find valuable and interesting. It is presented here in the form of charts.

These charts are part of the tentative report of the Committee on Economics of Motor Vehicle Size and Weight made into a sound motion picture by the Public Roads Administration. They represent preliminary results of the Pilot Test Study conducted last summer (CCJ Sept. 1948, page 34). It should be understood that these few charts deal with only

a fractional part of the factual data which the research project undertaken by the Highway Research Board will uncover.

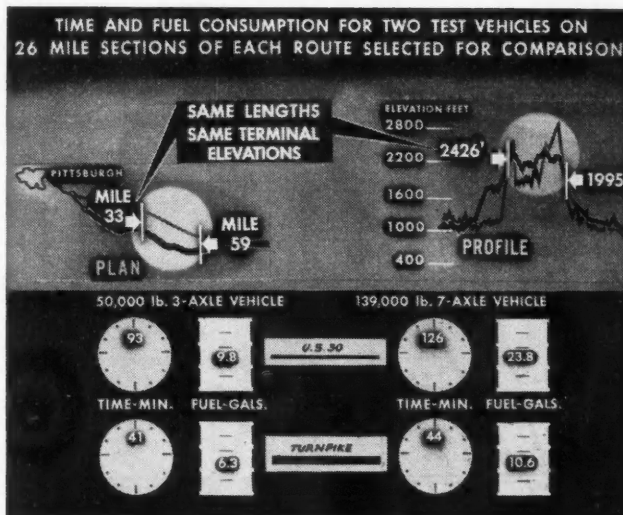
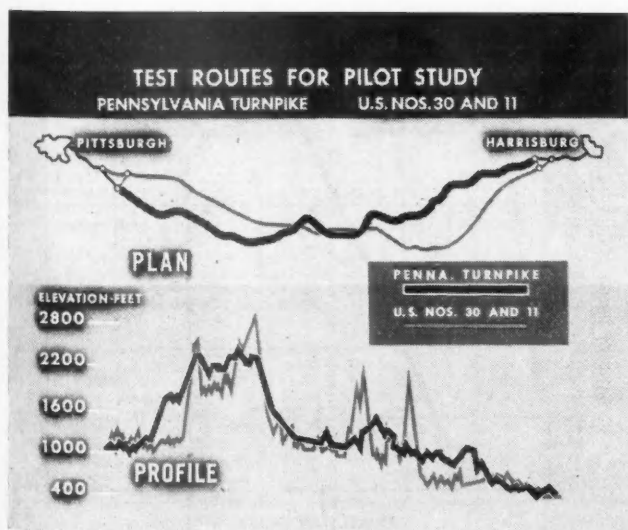
Being partial and tentative, the charts do not permit a valid economic comparison of different vehicles or vehicle types. They do show, however, how the same vehicles operating over a highway of modern construction and over a highway of low design standards which is typical of most highways in use, differ as to running time and fuel consumption. The modern highway, with its lower grades, better sight distances and one-way traffic, provides really substantial savings in travel time and fuel.

All of the charts are self-explanatory. They were prepared especially

for this presentation by the Public Roads Administration, a kindness and example of cooperation which is hereby gratefully acknowledged. But, in the words of the sound movie script, "These are only samples of the Pilot Study findings—examples of more to come. They illustrate a quest for truth, for a better understanding of the problems of highway transportation . . . and for more light in their solution."

Remaining phases of the study will develop all elements of both direct and indirect hauling cost under actual operating conditions as well as complete data relative to the cost of providing highway facilities. Included are intense case study of actual vehicle

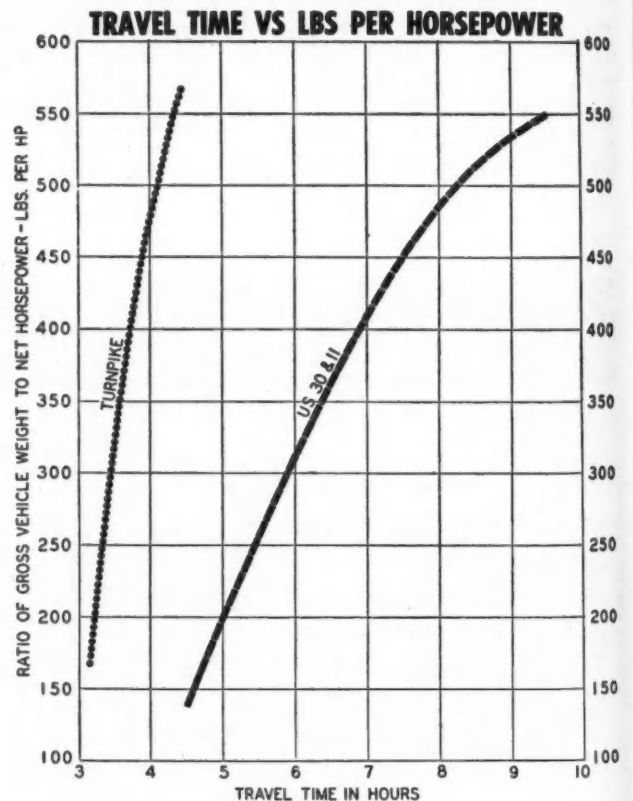
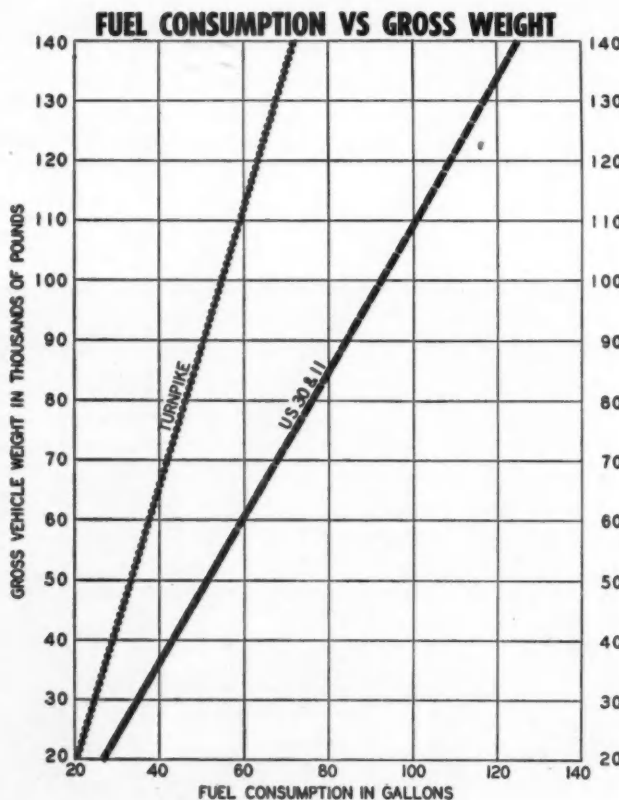
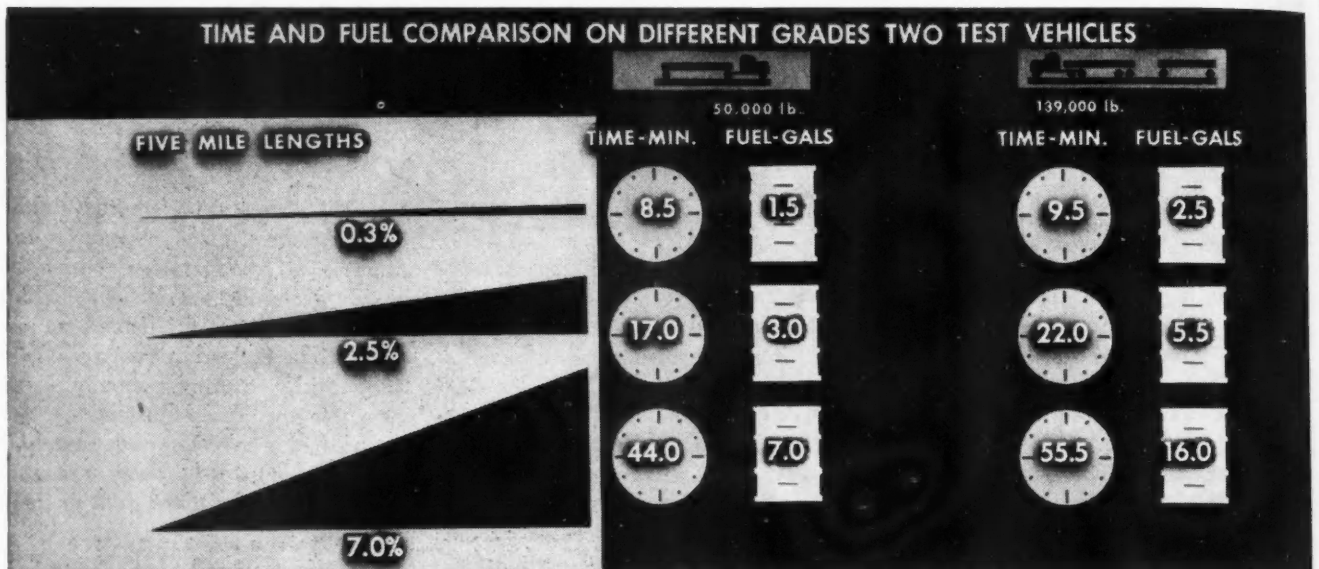
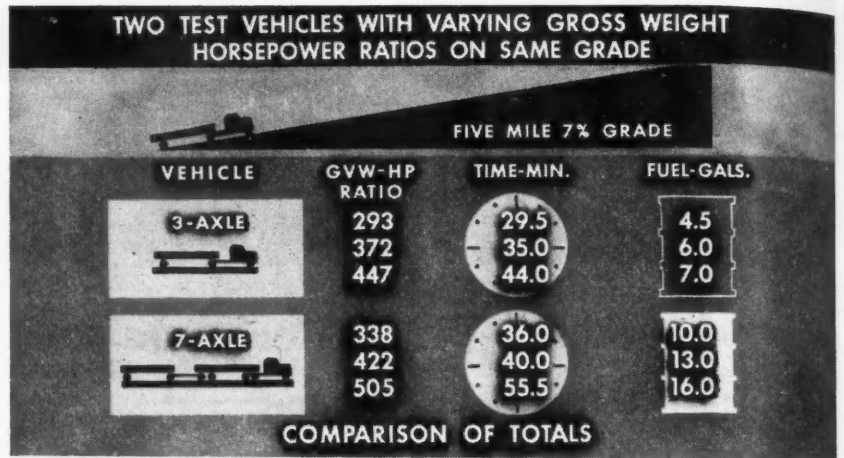
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PILOT TEST

Continued from Page 127

cle operation on various highways, economic analysis of the demand for various types of commodity transportation, and investigation of the cost of varied standards and capacities of roads and bridges.



NOTES ON HEADINGS

Column 2. The capacity of the third axle is not to be confused with the total capacity made possible on the converted vehicle.

Column 3. The price of the unit includes the standard brakes specified in brake column and frame extensions that extend forward under the cab. Tires and brake (air or vacuum) power are not included in price nor is the cost of installation.

Column 4. Weight of third axle unit includes all appurtenances and maximum tires.

Column 15 gives brake lining area of attachment unit only.

ABBREVIATIONS

COLUMN 9	COLUMN 12
Che—Chevrolet	A—Air
Shu—Shuler	B—Bendix
Tim—Timken	C—Chevrolet
	F—Ford
	H—Hydraulic
COLUMN 10	L—Lockheed
D—Driving	M—Mechanical
R—Rectangular	O—Own
S—Solid round	V—Vacuum Power
Sq—Square	W—Westinghouse
T—Tubular	

COLUMN 13

CA—Cast Alloy Iron

†—Own or Westinghouse optional.

††—49 in. spacing also available with 49 in. spring.

†††—On application.

—Equipped with gravity spring suspension.

(w)—New pusher-type axle recently introduced by Detroit Automotive Products Corp.

(x)—Patented 4-wheel chain drive available for all Tractor units.

(y)—All Truxmore units equipped with

radius rods on driving axle and load distribution may be adjusted within limits shown in cols. 6 & 7.

(z)—Depends upon installation.

Note 1. Two-axle self-steering undercarriage uses any standard trailer axle.

THIRD AXLE MAKE AND MODEL and Truck Model Adapted to	Capacity (Lb.) See Explanatory Notes	Price (f. o. b. factory)	Weight (Lb.) with Max. Tires, Frame Extension, Etc.	Maximum Tire Size	LOAD DIS- TRIBUTION RANGE		Axle Spacing (in inches) (with maximum tires)	AXLE DATA			BRAKES (Standard)				Number of Points of Frame Support	Spring Size or Number Leaves Added	Spindle Diameter (at inner bearing)
					(First Figure or combination applies to center axle; second figure to third axle)			Make	Type	Size	Make and Type	Drum Material	Brake Diameter and Width	Lining Area			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Trailing Axles																	
FABCO																	
220 (Ford).....	11000	775	2000	8.25/20	52-48	.....	44	Tim	T	4½	LH	CA	15x3½	192	2	48x2½	2½
220 (Chevrolet).....	11000	775	2000	8.25/20	52-48	.....	44	Tim	T	4½	LH	CA	15x3½	192	2	48x2½	2½
220 (All other makes).....	11000	775	2000	8.25/20	52-48	.....	44	Tim	T	4½	LH	CA	16x3½	205	2	48x2½	2½
330 (All other makes).....	13000	975	3000	10.00/20	52-48	.....	48	Tim	T	4½	LH	CA	16x3½	205	2	48x3	2½
325 (Ford F-7).....	13000	1173	3000	9.00/20	52-48	.....	44	Tim	T	4½	M	CA	16½x5	325	2	48x3	3
330 (Ford F-8).....	13000	1173	3000	10.00/20	52-48	.....	48	Tim	T	4½	M	CA	16½x5	325	2	48x3	3
800 (All other makes).....	18000	1300	3200	11.00/20	55-45	.....	52	Tim	T	5	M	CA	16½x7	435	2	56x4	3¾
FRAZIER																	
10E Tandem.....	9000	††	1000	9.00/20	54-46	.....	42	Tim	T	4½	Tim	CA	16½x4	290	6	None	2½
12E Tandem.....	18000	†††	1450	10.00/20	54-46	.....	44	Tim	T	4½	Tim	CA	16½x5	362	6	None	2½
14E Tandem.....	18000	††	2600	11.00/22	54-46	.....	48	Tim	T	5	Tim	CA	16½x6	434	6	None	3¾
LITTLE GIANT																	
8-ton (For any 1½ ton truck).....	18000	††	1920	8.25/20	53-47	.....	42††	Ow-Shu	Sq	2¾	Opt	CA	16x3	167	4	42x2½††	2¾
10-ton (For any 2 ton truck).....	18000	††	2450	9.00/20	50-50	.....	44††	Ow-Shu	Sq	3	Opt	CA	16x3½	180.	4	44x3††	3
12-ton (For any 2½ to 5 ton truck).....	20000	††	3000	10.00/20	50-50	.....	44††	Ow-Shu	Sq	3¾	Opt	CA	17x4	250	4	44x3½††	3
LOAD BOOSTER (w)																	
LB28C Chev. 1½ & 2 Ton.....	12000	.....	1900	8.25/20	50-50	.....	44	Ow	T	4½	VH	CA	16x3	218	4	44x2½	2½
LB33C Chev. 1½ & 2 Ton.....	14000	.....	2100	9.00/20	50-50	.....	48	Ow	T	4½	VH	CA	16x4	372	4	48x2½	2½
LB28F Ford F5 & F6.....	12000	.....	1900	8.25/20	50-50	.....	44	Ow	T	4½	VH	CA	15x3½	196	4	44x2½	2½
LB33F Ford F5 & F6.....	14000	.....	2100	9.00/20	50-50	.....	48	Ow	T	4½	VH	CA	16x4	372	4	48x2½	2½
LB38F Ford F7 & F8.....	16000	.....	2600	10.00/20	50-50	.....	48	Ow	T	5	VH	CA	16x4	372	4	48x2½	3¼
LB28D Dodge 1½ & 2 Ton.....	12000	.....	1900	8.25/20	50-50	.....	44	Ow	T	4½	VH	CA	15x3½	196	4	44x2½	2½
LB33D Dodge 1½ & 2 Ton.....	14000	.....	2100	9.00/20	50-50	.....	48	Ow	T	4½	VH	CA	16x4	372	4	48x2½	2½
LB38D Dodge 2½ & 3 Ton.....	18000	.....	2800	10.00/20	50-50	.....	48	Ow	T	5	VH	CA	16x4	372	4	48x2½	3¼
LB28V Various 1½ & 2 Ton.....	12000	.....	1900	8.25/20	50-50	.....	44	Ow	T	4½	VH	CA	16x4	372	4	44x2½	2½
LB33V Various 1½ & 2 Ton.....	14000	.....	2100	9.00/20	50-50	.....	48	Ow	T	4½	VH	CA	16x4	372	4	48x2½	2½
LB38V Various 2½ & 3 Ton.....	16000	.....	2800	10.00/20	50-50	.....	48	Ow	T	5	VH	CA	16x4	372	4	48x2½	3¼
TRAILMOBILE																	
CTA-22 (All trucks to 2-ton).....	11000	††	1626	8.25/20	58-42	.....	46	Tim	T	4½	Tim	CA	16½x4	290	4	None	2½
CTA-32 (All trucks to 2 ½ ton).....	13000	††	2073	11.00/22	58-42	.....	48	Tim	T	4½	Tim	CA	16½x5	362	4	None	2½
CTA-42 (All heavy-duty trucks).....	18000	††	2263	11.00/22	58-42	.....	48	Tim	T	5	Tim	CA	16½x6	434	4	None	3¼
TRUCKTOR (x)																	
HLL (Ford 1½-ton).....	8800	690	1750	7.50/20	53-47	.....	45	Ow	Sr	3	LHV	CA	15x3½	196	6	38½x2½	2½
HLL (Chevrolet 1½-ton).....	8800	690	1750	7.50/20	53-47	.....	45	Ow	Sr	3	LHV	CA	16x3	219	6	38½x2½	2½
HLL (Light trucks, tires to 8.25x20).....	11000	795	1895	8.25/20	53-47	.....	45	Ow	Sr	3	LHV	CA	16x2½	132	6	38½x2½	2½
HLS (Medium trucks, tires to 9.00x20).....	14000	1225	2265	9.00/20	53-47	.....	46	Ow	Sr	3½	LHV	CA	16x3½	265	6	38½x3	2½
HLS (Ford F-7) tires to 9.00x20.....	14000	1225	2265	9.00/20	53-47	.....	46	Ow	Sr	3½	LHV	CA	16½x3½	218	6	38½x3	2½
HLR (Heavy truck, tires to 10.00x20).....	16000	1680	2710	10.00/20	53-47	.....	48	Ow	Sr	3½	WAM	CA	16½x6	251	6	40x3	2½
HLR (Ford F-8, tires to 10.00x20).....	16000	1525	2710	10.00/20	53-47	.....	48	Ow	Sr	3½	LHV	CA	16x5	335	6	40x3	2½
HR (Heavy-duty, tires to 12.00x20).....	21000	1840	3177	11.00/24	53-47	.....	52	Ow	Sr	4	WAM	CA	16½x8	251	6	41½x3	3
HR-6 (Extra heavy-duty).....	30000	††	3358	12.00/24	53-47	53½	Ow	Sr	5½	WAM	CA	17½x5½	380	6	43½x4	3¾

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SPECIFICATIONS FOR THIRD AXLES

Continued from Page 129

THIRD AXLE MAKE AND MODEL and Truck Model Adapted to	Capacity (Lb.) See Explanatory Notes	Price (f. o. b. factory)	Weight (Lb.) with Max. Tires, Frame Extension, Etc.	Maximum Tire Size	LOAD DIS- TRIBUTION RANGE		Axle Spacing (in inches) (with maximum tire)	AXLE DATA			BRAKES (Standard)				Number of Points of Frame Support	Spring Size or Number Leaves Added	Semi- Diameter (at inner spring)
					(First Figure or combination applies to center axle; second figure to third axle)			Make	Type	Size	Make and Type	Drum Material	Brake Diameter and Width	Lining Area			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Trailing Axles—cont																	
TRUXMORE (y)																	
280 Series.....	12000	***	2700	8.25/20	53-47	62-38	44 1/2-48	Own	Sq	2 3/4	H	CA	15x3 1/2	200	4	..	2 1/2
340 (Standard).....	14000	***	3100	9.00/20	52-48	60-40	47-48	Own	Sq	3	H	CA	16x3 1/2	210	4	..	2 1/2
340HT (Hi-tork brake).....	14000	***	3200	9.00/20	52-48	60-40	47-48	Own	Sq	3	H	CA	16x5 1/2	340	4	..	2 1/2
340A (Air brake).....	14000	***	3300	9.00/20	52-48	60-40	47-48	Own	Sq	3	MW	CA	16 1/2 x 4 1/2	305	4	..	2 1/2
400 (Hi-tork Hyd. brake).....	16000	***	3600	10.00/20	51-49	60-40	47 1/2-48 1/2	Own	Sq	3 1/4	H	CA	16x5 1/2	340	4	..	2 1/2
400 (Opt. size brake).....	16000	***	3650	10.00/20	51-49	60-40	47 1/2-48 1/2	Own	Sq	3 1/4	H	CA	16x6 1/2	410	4	..	2 1/2
400A (Air brake).....	16000	***	3700	10.00/20	51-49	60-40	47 1/2-48 1/2	Own	Sq	3 1/4	MW	CA	16 1/2 x 5 1/2	380	4	..	2 1/2
450 (Hi-tork Hyd. brake).....	18000	***	3900	11.00/20	51-49	60-40	49-50	Own	Sq	3 1/2-3 3/4	H	CA	16x6 1/2	410	4	..	2 1/2
450A (Air brake).....	18000	***	3950	11.00/20	51-49	60-40	49-50	Own	Sq	3 1/2-3 3/4	MW	CA	16 1/2 x 6 1/2	455	4	..	2 1/2
50H (Hyd. brake).....	20000	***	4200	11.00/24	50-50	65-35	49-53	Own	Sq	3 1/2	H	CA	17 1/2 x 5 1/2	360	4	..	2 1/2
50A (Air brake).....	20000	***	4300	11.00/24	50-50	65-35	49-53	Own	Sq	3 1/2	MW	CA	17 1/2 x 5 1/2	410	4	..	2 1/2
UTILITY																	
25 (For any 1 1/2-ton truck).....	9000	1037	1330	8.25/20	55-45		41	Own	Sq	2 1/2	BH†	CA	16x3 1/2	230	4	None	2 1/2
30 (For any 3 1/2-ton truck).....	13000	1465	1880	10.00/20	55-45	68/33	44	Own	Sq	3	BH†	CA	17x4	270	4	None	2 1/2
35 (For any 5-ton truck).....	18000	1758	2285	11.00/24	55-45	68/33	50	Own	Sq	3 1/2	OMV†	CA	16x5	300	4	None	2 1/2
Driving Axles																	
FABCO																	
520 Ford.....	10500	1400	2400	8.25/20	50-50		44	Tim	D		FH	CA	15x3 1/2	192	2	48x2 1/2	2 1/2
520 (Chevrolet with H. D. Axles).....	10500	1475	2400	8.25/20	50-50		44	Chev	D		CH	CA	16x3	176	2	48x2 1/2	2 1/2
520 (All other makes).....	10500	(2)	2400	8.25/20	50-50		44	Match	D		LH	CA	Match	(2)	2	48x2 1/2	2 1/2
630 (All other makes).....	13000	(2)	3000	10.00/20	50-50		48	Match	D		LH	CA	Match	(2)	2	53x3	2 1/2
625 (Ford F-7).....	14000	(2)	3200	10.00/20	50-50		44	Ford	D		FH	CA	16 1/2 x 3 1/2	350	2	48x3	2 1/2
630 (Ford F-8).....	16000	(2)	3600	10.00/20	50-50		48	Ford	D		FH	CA	16x5	(2)	2	53x3	2 1/2
THORNTON DRIVE																	
A3C26 Chev. 1 1/2 ton.....	11250		3200	8.25/20	50-50		48	Chev 1S	D	3 1/2	VH	CA	18x3	218	4	48x2 1/2	2 1/2
AC429 Chev. 2 ton.....	12500		3300	8.25/20	50-50		48	Chev 1S	D	4	VH	CA	18x3	218	4	48x2 1/2	2 1/2
A2C29 Chev. 2 ton.....	12750		3300	8.25/20	50-50		48	Chev 2S	D	4 1/2	VH	CA	15x3 1/2	198	4	48x2 1/2	2 1/2
A8D29 Dodge FA, KA, JA.....	12750		3300	8.25/20	50-50		48	Dodge2S	D	4 1/2	VH	CA	15x3 1/2	198	4	48x2 1/2	2 1/2
A6D34 Dodge KA, KMA.....	14250		3600	9.00/20	50-50		52 1/2	Dodge2S	D	4 1/2	VH	CA	16 1/2 x 3 1/2	207	4	52 1/2 x 2 1/2	2 1/2
A1F26 Ford F5.....	11250		3200	8.25/20	50-50		48	Ford 1S	D	3 1/2	VH	CA	15x3 1/2	198	4	48x2 1/2	2 1/2
A2F29 Ford F6.....	12750		3300	8.25/20	50-50		48	Ford 2S	D	4 1/2	VH	CA	15x3 1/2	198	4	48x2 1/2	2 1/2
A2F31 Ford F7.....	12750		3400	9.00/20	50-50		48	Ford 2S	D	4 1/2	VH	CA	15x3 1/2	198	4	48x2 1/2	2 1/2
A14F38 Ford F8.....	16500		3800	10.00/20	50-50		52 1/2	Ford 2S	D	5 1/2	VH	CA	16x5	350	4	52 1/2 x 2 1/2	2 1/2
A15F38 Ford F8.....	16500		3700	10.00/20	50-50		52 1/2	Ford 1S	D	5 1/2	VH	CA	16x5	350	4	52 1/2 x 2 1/2	2 1/2
A6G34 GMC 450 Series.....	14250		3600	9.00/20	50-50		52 1/2	GMC 2S	D	4 1/2	VH	CA	16 1/2 x 3 1/2	207	4	52 1/2 x 2 1/2	2 1/2
A2 Various.....	12750			8.25/20	50-50		48	GMC 2S	D	5 1/2	VH	CA	15x3 1/2	198	4	48x2 1/2	2 1/2
A6 Various.....	14250			9.00/20	50-50		52 1/2	GMC 2S	D	4 1/2	VH	CA	16 1/2 x 3 1/2	207	4	52 1/2 x 2 1/2	2 1/2
Trailer Suspensions																	
FRAZIER																	
10E Tandem.....	30000	***		12.00/22	50-50		50	Tim	T	5	Tim	CA	16 1/2 x 6	434	6	42x3	
12E Tandem.....	36000	***		12.00/22	50-50		50	Tim	T	5	Tim	CA	16 1/2 x 7	435	6	42x3	
14E Tandem.....	48000	***		12.00/22	50-50		53	Tim	T	SR	Tim	CA	16 1/2 x 7	435	6	42x3	
HOOBLER																	
(Note 1).....	36000	**	6300	11.00/20	50-50		108 1/4	Note 1	Note 1	Var	Var	Var	Var	Var	1	42x4	Var
LITTLE GIANT																	
(Tandem conversions for single axle trailers).....	15000	**		7.00/20	50-50		42	Shu	Sq	2 3/4	AH	CA	15x3 1/2		2		2 1/2
	20000	**		7.00/20	50-50		44	Shu	Sq	3	AH	CA	16x3 1/2		2		2 1/2
	25000	**		7.00/20	50-50		44	Shu	Sq	3 1/4	AH	CA	16x5		2		2 1/2
NEWAY (Tandem)																	
302.....	34000	730	4450	11.00/20	50-50		48	Var	Var	Var	Var	Var	Var	Var	1	Var	Var
402.....	40000	760	4500	11.00/20	50-50		48	Var	Var	Var	Var	Var	Var	Var	1	Var	Var
802.....	36000	730	4600	11.00/22	50-50		50 1/2	Var	Var	Var	Var	Var	Var	Var	1	Var	Var
1002.....	48000	770	4650	12.00/20	50-50		50 1/2	Var	Var	Var	Var	Var	Var	Var	1	Var	Var
1602.....	42000	810	4750	11.00/24	50-50		53	Var	Var	Var	Var	Var	Var	Var	1	Var	Var
TRUCKTOR																	
T-11 (Single).....	11000	550	2000	8.25/20				Own	Sr	3	LHV	CA	16x3 1/2	236	4	56	
T-14 (Single).....	14000	580	2300	9.00/20				Own	Sr	3 1/4	LHV	CA	17 1/2 x 4	251	4	56	
T-16 (Single).....	16000	605	2600	10.00/20				Tim	T	5	MA	CA	16 1/2 x 6	438	4	56	
T-18 (Single).....	18000	635	2750	11.00/20				Tim	T	5	MA	CA	18 1/2 x 7	512	4	56	
T-20 (Single).....	20000	745	2900	11.00/22				Tim	T	5 1/2	MA	CA	18x7	450	4	56	
T-25 (Single).....	25000	910	3750	12.00/24				Ow-Tim	Opt	6	MA	CA	18x7	450	4	56	
TT-14 (Tandem).....	28000	1150	4800	9.00/20	50-50		48	Own	Sr	3	MA	CA	17 1/2 x 4	251	6	45 1/2	
TT-16 (Tandem).....	32000	1225	5000	10.00/20	50-50		50	Tim	T	5	MA	CA	18 1/2 x 6	438	6	46 1/2	
TT-18 (Tandem).....	36000	1400	5200	11.00/20	50-50		50	Tim	T	5	MA	CA	16 1/2 x 7	512	6	46 1/2	
TRUXMORE (y) Tandem conversions																	
280 Series.....	12000	***	2700	8.25/20	53-47	62-38	44 1/2-48	Own	Sq	2 3/4	H	CA	15x3 1/2	200	4	..	2 1/2
340 (Standard).....	14000	***	3100	9.00/20	52-48	60-40	47-48	Own	Sq	3	H	CA	16x3 1/2	210	4	..	2 1/2
340HT (Hi-tork brake).....	14000	***	3200	9.00/20	52-48	60-40	47-48	Own	Sq	3	H	CA	16x5 1/2	340	4	..	2 1/2
340A (Air brake).....	14000	***	3300	9.00/20	52-48	60-40	47-48	Own	Sq	3	MW	CA	16 1/2 x 4 1/2	305	4	..	2 1/2
400 (Hi-tork Hyd. brake).....	16000	***	3600	10.00/20	51-49	60-40	47 1/2-48 1/2	Own	Sq	3 1/4	H	CA	16x5 1/2	340	4	..	2 1/2
400 (Opt. size brake).....	16000	***	3650	10.00/20	51-49	60-40	47 1/2-48 1/2	Own	Sq	3 1/4	H	CA	16x6 1/2	410	4	..	2 1/2
400A (Air brake).....	16000	***	3700	10.00/20	51-49	60-40	47 1/2-48 1/2	Own	Sq	3 1/4	MW	CA	16 1/2 x 5 1/2	380	4	..	2 1/2
450 (Hi-tork Hyd. brake).....	18000	***	3900	11.00/20	51-49	60-40	49-50	Own	Sq	3 1/2-3 3/4	H	CA	16x6 1/2	410	4	..	2 1/2
450A (Air brake).....	18000	***	3950	11.00/20	51-49	60-40	49-50	Own	Sq	3 1/2-3 3/4	MW	CA	16 1/2 x 6 1/2	455	4	..	2 1/2
50H (Hyd. brake).....	20000	***	4200	11.00/24	50-50	65-35	49-53	Own	Sq	3 1/2	H	CA	17 1/2 x 5 1/2	360	4	..	2 1/2
50A (Air brake).....	20000	***	4300	11.00/24	50-50	65-35	49-53	Own	Sq	3 1/2	MW	CA	17 1/2 x 5 1/2	410	4	..	2 1/2
UTILITY																	
5WX-10 (Tandem).....	30000	**		10.00/22	50-50		50	Own	Re			CA	6 in	210	6	10-3 in	
5WX-12 (Tandem).....	36000	**		11.00/22	50-50		50	Own	Re			CA	10 in	330	6	11-3 in	
5WX-15 (Tandem).....	44000	**		12.00/24	50-50		52	Own	Re			CA	10 in	330	6	12-3 in	

Safety Equipment

Required & Permitted on Trucks, Truck-Tractors, Trailers & Buses

As Specified in I.C.C. Safety Rules & Regulations, State Motor Vehicle Laws & Official Rulings . . . and Compiled by Safety Equipment Mfrs. Assn.

TABULATION OF SAFETY REQUIREMENTS ON PAGES 132 & 133

EXPLANATION OF I.C.C. REFERENCES

#—The I.C.C. Motor Carrier Safety Regulations apply to "Automotive Safety Equipment" on vehicles operated by common and contract carriers ("for hire" carriers) of persons or property and by private carriers of property, when operated regularly in interstate or foreign commerce, except when operated wholly within a municipality, between contiguous municipalities, or within a zone adjacent to and commercially a part of any such municipality or municipalities. When vehicles of common, contract or private carriers are transporting explosives or other dangerous articles the last-mentioned exception does not apply.

##—Requires "a device or other means of preventing or removing ice or frost" from windshield.

###—I.C.C. neither approves nor disapproves any individual required item. Its Motor Carrier Safety Regulations, however, set forth certain constructional details or performance standards to which certain items must conform. Reference should be made to the Motor Carrier Safety Rules for complete details.

COLOR AND REQUIREMENT SYMBOLS

A—Amber
G—Green
R—Red
N—No
NP—Not Permitted
NR—Not Required
NS—Not Specified

NSM—Not Specifically Mentioned
Y—Yes
Ye—Yellow
W—White
/—When used between two letters or numbers means "or."
Example—2/4 means "2 or 4."

GENERAL FOOTNOTES

e—Prohibits red light visible from in front of vehicle.
b—Prohibits red or green light visible from in front of vehicle.
c—Tail lamp or separate lamp shall illuminate rear license plate with white light.
d—Must be located and constructed so as to illuminate rear license plate with white light.
e—May be incorporated in tail lamp.
f—Semaphores required on school buses.
g—One or both may be incorporated in tail lamp or lamps.
h—Number plate must be illuminated with white light.
i—Also two yellow reflectors on front of truck 70 in. or more in width and bus over 7 passengers.
j—Also one amber reflector on front of vehicle.
k—One may be part of tail lamp.
l—Combination tail-stop lamp required on cabin trailers.
m—Reflectors may be substituted.
n—Reflectors may be used when vehicle has acetylene lamps.
o—Clearance and marker lamps may be in combination.
p—Where green originally used, may be continued till replacements are necessary.
r—Yellow or orange flags required.
t—On vehicles over 45 feet long, rear clearance and marker lamps shall be in combination.
u—One green marker lamp every 10 feet on combinations over 33 feet long.

u—Reflectors required on front and/or rear of vehicle.
v—Rear clearance lamps may be red. May also be green on vehicles used prior to January 1, 1940.
w—Both lamps must show white to front and red to rear.
x—Step lamps required on all buses.
y—Trailer and semi-trailers shall have one lamp on front visible from both sides.
z—May be used only for reading signs or as an emergency light.
aa—Every vehicle 72 in. or more wide must have 2 amber or clear front, and 2 amber, clear or red rear reflectors. Clearance lamps may be substituted. Reflectors must be approved. Clearance lamps need not be approved.
cc—Vehicles manufactured after January 1, 1943, shall have double wipers.
dd—On interstate buses—green lights adjacent to destination sign or near upper corners;
On intrastate buses—purple lights in same locations.
ee—Double wipers required on all school buses.
ff—Two yellow stop lamps required on all buses.
ii—Clearance and marker lamps may be in combination. When in combination there must be one such lamp on each side, midway of vehicle.
xx—Fog lamps are included within the term "Auxiliary Driving Lamps" and are treated accordingly.

SAFETY EQUIPMENT REQUIREMENTS

REFERENCES AND SYMBOLS EXPLAINED ON PAGE 101

JURISDICTION EXERCISING- IFC CONTROL OVER USE OF EQUIPMENT LISTED.	SAFETY EQUIPMENT																																					
	TO BE MOUNTED ON VEHICLES																																					
	HEAD LAMPS			TAIL LAMPS			STOP LAMPS			REAR RE- FLECTORS			CLEARANCE LAMPS			SIDE- MARKER LAMPS			IDENTIFI- CATION LAMPS			DIRECTION SIGNALS			SIDE REFLECTORS			REAR VIEW MIRROR										
	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED	NUMBER	COLOR	MUST BE APPROVED								
I.C.C.	2	NS	###	1	R	###	1	A/R	###	3	G	###	2	A	R	###	2	A	R	###	NR	---	---	NR	---	---	2	A	R	###	1	###						
ALA.	2	NS	Y	1	R	Y	1	R	Y	NR	---	---	2	W	R	N	NR	---	---	NR	---	---	NR	---	---	NS	---	Y	NR	---	---	1	N					
ARIZ.	2	NS	Y	1	R	Y	1	R	Y	NR	---	---	2	W	R	Y	NR	---	---	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	1	N				
ARK.	2	NS	Y	1	R	Y	NR	---	---	1	R	Y	2	G	R	N	4	G	R	N	2	G	R	N	4	R	R	Y	NR	---	---	---	1	N				
CALIF.	2	W	Y	1	R	Y	1	R	Y	2	R	Y	4	A	A	Y	NR	---	---	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	1	N			
COLO.	2	W	Y	1	R	Y	1	R	Y	2	R	Y	4	A	R	Y	4	A	R	Y	NR	---	---	NR	---	---	4	A	A	Y	4	A	R	Y	1	N		
CONN.	2	W	Y	1	R	N	1	R	N	2	W	Y	4	A	W	N	NR	---	---	2	dd	NR	N	4	Y	Y	Y	NR	---	---	---	---	1	N				
DEL.	2	W	Y	1	R	Y	NR	---	---	2	R	Y	4	A	R	Y	1	---	---	Y	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	1	W		
D. C.	2	NS	N	1	R	N	NR	---	---	2	R	Y	4	A	R	Y	4	A	R	Y	NR	---	---	NR	---	---	4	A	A	Y	4	A	R	Y	1/2	N		
FLA.	2	NS	Y	1	R	N	1	A/R	N	2	R	N	2	A	R	N	2	A	R	N	NR	---	---	NR	---	---	4	A	R	N	---	---	---	---	1	N		
GA.	2	NS	N	1	R	N	1	R	N	2	R	N	2	A	R	N	2	A	R	N	NR	---	---	NR	---	---	4	A	R	N	---	---	---	---	1	W		
IDA.	2	W	Y	1	R	Y	1	R	Y	2	R	Y	2	A	R	Y	2	A	R	Y	NR	---	---	NR	---	---	NS	A	R	Y	4	A	R	Y	1	W		
ILL.	2	W	N	1	R	N	1	R	N	1	R	N	NS	NS	NS	N	NS	NS	NS	N	2	G	R	N	NS	A	R	Y	4	A	A	Y	4	A	A	Y	1	W
IND.	2	W	N	1	R	N	1	R	N	2	R	N	2	A	R	N	2	A	R	N	NR	---	---	NR	---	---	4	A	A	Y	2	A	R	N	1	W		
IOWA	2	NS	Y	1	R	Y	1	R	Y	2	R	Y	2	A	R	Y	2	A	R	Y	2	W	R	Y	NR	---	---	2	A	R	Y	NR	---	---	---	1	W	
KAN.	2	NS	Y	1	R	Y	1	R	Y	1	R	Y	2	A	R	Y	4	A	R	Y	2	A	R	Y	NR	---	---	NR	---	---	---	---	---	---	---	1	Y	
Ky	2	W	N	1	R	N	1	R	N	1	---	---	2	A	R	N	4	A	R	N	1	G	R	N	NR	---	---	4	A	R	N	---	---	---	---	1	W	
LA.	2	NS	Y	1	R	Y	1	R	Y	NR	---	---	2	A	R	Y	2	A	NR	Y	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	---	1	W	
ME.	2	NS	Y	1	R	Y	NR	---	---	1	R	N	2	A	R	N	NR	---	---	---	1	W	NR	N	NR	---	---	NR	---	---	---	---	---	---	---	1	W	
MD.	2	NS	Y	1	R	Y	1	A/R	Y	1	R	Y	4	A	R	N	4	A	R	N	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	---	1	W	
MASS.	2	W	Y	1	R	Y	NR	---	---	1	R	Y	1	G	NR	N	NR	---	---	---	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	W	
MICH.	2	W	Y	1	R	N	1	A/R	N	2	R	N	4	A	R	N	4	A	R	N	NR	---	---	NR	---	---	NR	---	---	---	2	A	R	N	---	---	1	W
MINN.	2	W	Y	1	R	Y	1	R	Y	1	R	Y	4	A	R	Y	4	A	R	Y	NR	---	---	NR	---	---	4	Y	R	Y	NR	---	---	---	---	1	W	
MISS.	2	NS	Y	1	R	Y	1	R	Y	1	R	Y	2	G	R	N	4	G	R	N	2	G	R	N	4	A	A	Y	NR	---	---	---	---	1	N			
MO.	2	W	Y	1	R	N	NR	---	---	2	A	Y	2	A	R	N	2	A	R	N	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	N	
MONT.	2	W	Y	1	R	N	NR	---	---	NR	---	---	4	A	R	N	NR	---	---	---	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	N	
NEBR.	2	NS	Y	1	R	Y	1	R	Y	NR	---	---	2	A	R	N	NR	---	---	---	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	N	
NEV.	2	NS	N	1	R	N	1	R	N	2	R	N	2	A	R	N	2	A	R	N	NR	---	---	NR	---	---	4	A	R	N	---	---	---	---	1	Y		
N. H.	2	NS	Y	1	R	Y	NR	---	---	2	R	Y	4	A	R	Y	2	A	R	Y	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	---	1	W	
N. J.	2	W	Y	1	R	Y	1	R	Y	1/2	R	Y	NR	---	---	---	---	---	---	---	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	---	1	W	
N. W.	2	NS	Y	1	R	Y	1	A/R	Y	1/2	R	Y	2	A	R	Y	4	A	R	Y	NR	---	---	NR	---	---	4	A	A	Y	4	A	R	Y	1	W		
N. Y.	2	Y	Y	1	R	Y	1	R	Y	1/2	R	Y	NR	---	---	---	---	---	---	---	NR	---	---	NR	---	---	4	A	A	Y	NR	---	---	---	---	1	W	
N. C.	2	NS	Y	1	R	Y	1	R	Y	1	R	Y	4	A	R	Y	NR	---	---	---	NR	---	---	NR	---	---	NS	NS	---	NR	---	---	---	---	1	W		
N. D.	2	NS	Y	1	R	Y	NR	---	---	NR	---	---	2	W	R	Y	NR	---	---	---	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	W	
OHIO	2	W	N	1	R	N	1	A/R	N	2	L	R	N	4	A	R	N	4	A	R	N	NR	---	---	NR	---	---	4	A	R	N	---	---	---	---	1	W	
OKLA.	2	W	N	1	R	N	1	NS	N	2	NS	N	4	A	R	N	4	A	R	N	NR	---	---	NR	---	---	4	A	R	N	---	---	---	---	1	W		
ORE.	2	NS	Y	1	R	Y	1	A/R	Y	2	R	Y	2	A	R	Y	2	A	R	Y	NR	---	---	NR	---	---	2	A	A	Y	NR	---	---	---	---	1	N	
PENN.	2	NS	Y	1	R	Y	NR	---	---	1	R	Y	2	A	R	N	4	A	R	N	NR	---	---	NR	---	---	2	A	A	Y	NR	---	---	---	---	1	N	
R. I.	2	W	Y	1	R	N	NR	---	---	1	R	Y	NR	---	---	---	---	---	---	---	NR	---	---	NR	---	---	4	A	A	Y	1	A/R	NR	Y	---	1	W	
S. C.	2	W	N	1	R	N	1	A/R	Y	1	R	N	2	A	R	N	2	A	R	N	2	A	R	N	4	A	A	N	2	A	R	N	---	---	---	1	W	
S. D.	2	NS	Y	1	R	Y	1	R	Y	1	R	N	2	W	R	Y	NR	---	---	---	2	G	R	Y	4	A	A	Y	NR	---	---	---	---	---	1	N		
TENN.	2	NS	Y	1	R	Y	1	A/R	Y	2	R	N	4	A	R	Y	4	A	R	Y	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	N	
TEX.	2	W	Y	1	R	N	1	R	Y	2	R	Y	2	A	R	Y	2	A	R	Y	NR	---	---	NR	---	---	4	A	A	Y	2	A	R	Y	---	1	N	
UTAH	2	NS	Y	1	R	Y	1	A/R	Y	2	R	Y	4	A	R	N	4	A	R	N	NR	---	---	NR	---	---	4	A	A	Y	4	A	R	Y	---	1	Y	
VT.	2	NS	Y	1	R	Y	1	R	Y	NR	---	---	1	G	R	Y	NR	---	---	---	NR	---	---	NR	---	---	2	A	NS	NS	Y	NR	---	---	---	1	N	
VA.	2	W	Y	1	R	Y	1	R	Y	NR	---	---	4	A	G	Y	NR	---	---	---	1	W	NR	Y	4	A	A	Y	NR	---	---	---	---	---	1	Y		
WASH.	2	NS	Y	2	R	Y	1	R	Y	2	R	Y	4	Y	R	Y	2	A	R	Y	NR	---	---	NR	---	---	4	Y	Y	Y	4	A	R	Y	---	1	N	
W. VA.	2	NS	N	1	R	N	1	R	N	2	R	N	2	A	R	N	1	W	NR	N	1	W	NR	N	NR	---	---	4	A	R	N	---	---	---	---	1	N	
WISC.	2	W	Y	1	R	Y	1	R	Y	2	R	Y	2	A	R	Y	4	A	R	Y	NR	---	---	NR	---	---	NR	---	---	---	---	---	---	---	---	1	N	
WYOM.	2	NS	Y	1	R	Y	1	R	Y	1	R	Y	2	G	R	Y	NR	---	---	---	NR	---	---	NR	---	---	4	Y	Y	Y	NR	---	---	---	---	1	N	



SELECTION & OPERATION

REQUIRED

PERMITTED

TO BE CARRIED IN VEHICLES

TO BE MOUNTED

WIND- SHIELD WIPERS	DE- FROST- ERS	FIRE EXTIN- GUISH- ERS	LIQUID BURNING FLARES	ELECTRIC FLARES	REFLECTOR FLARES	FUSES	RED CLOTH FLAGS	LITE OR PROJECT OR	AUXILIARY DRIVING LAMPS	FOG LAMPS	SPOT LAMPS	DRIVING LAMPS PERMITTED LIT AT ONE TIME	JURISDICTION EXERCISE- IPC CONTROL OVER USE OF EQUIPMENT LISTED
NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	NUMBER MUST BE APPROVED	
1	1	1	3	3	3	3	2	1	2	2	2	4	I.C.O.
NR	NR	NR	2	NR	2	2	2	1	2	2	2	NS	ASA.
1	1	1	3	3	3	3	3	1	2	2	2	NS	ARIZ.
1	NR	2	3	3	3	NR	NR	1	3	2	1	4	ARK.
1	NR	1	2	2	2	NR	NR	2	2	2	2	4	CALIF.
1	NR	2	3	3	3	3	3	1	3	2	1	4	COLO.
1	NR	1	3	3	3	3	NR	1	2	2	1	4	CONN.
1	NR	NR	3	3	3	NR	NR	1	2	2	1	4	DEL.
2	NR	NR	NR	NR	NR	NR	NR	1	2	2	1	2	D. C.
1	NR	NR	3	3	NR	3	2	1	NR	NR	NR	NS	FLA.
1	NR	1	3	3	3	3	2	1	NR	NR	NR	NS	GA.
2	NR	NR	3	3	3	3	1	2	2	1	1	2	IDA.
1	NR	2	3	3	3	NR	NR	1	3	2	1	4	ILL.
1	NR	1	3	3	NR	3	2	1	3	2	1	4	IND.
1	NR	2	3	3	3	1	3	1	3	2	1	4	IOWA
1	NR	2	3	3	3	3	3	1	3	2	1	4	KAN.
1	NR	1	3	3	3	3	3	1	NR	NR	NR	NS	KY.
NR	NR	1	3	3	NR	NR	3	1	2	2	Prohibited	NS	LA.
1	NR	1	3	3	3	NR	2	1	2	2	1	NS	NE.
1	NR	2	3	3	3	NR	NR	1	3	2	1	4	ND.
1	NR	1	3	3	NR	NR	NR	NR	NR	NR	NR	NS	MASS.
1	NR	1	3	3	3	3	2	1	2	2	2	NS	WICH.
1	NR	1/2	3	3	3	NR	3	2	4	2	2	4	WISK.
1	NR	2	3	3	NR	3	2	1	3	2	1	4	MISS.
1	NR	NR	3	3	NR	3	2	1	3	2	1	4	MO.
NR	NR	NR	3	3	NR	NR	2	1	2	2	1	NS	MONT.
1	NR	NR	3	NR	NR	NR	NR	1	NR	NR	NR	NS	NEBR.
1	NR	1	3	3	NR	3	2	1	3	2	1	4	NEV.
1	NR	1	2	2	2	2	2	2	3	2	1	4	N.H.
1	NR	1	3	3	3	NR	NR	1	2	2	1	4	N. J.
1	NR	1	3	3	NR	3	3	1	2	2	1	4	N. Y.
NR	NR	1	2	2	NR	NR	2	1	NR	NR	NR	NS	N. C.
1	NR	2	2	2	NR	2	2	1	2	2	2	NS	N. D.
1	NR	2	3	3	NR	3	2	1	3	2	1	NS	OHIO
2	NR	1	3	3	NR	3	2	1	NR	NR	NR	NS	OKLA.
1	NR	1	3	3	3	NR	3	1	3	2	1	4	ORE.
1	NR	1	3	3	3	NR	3	1	3	2	1	4	PENN.
NR	NR	1	3	3	3	NR	NR	1	2	2	NR	NS	R. I.
1	NR	2	3	3	3	3	2	1	3	2	1	4	S. C.
NR	NR	NR	3	3	3	NR	NR	NR	3	2	1	NS	S. D.
NR	NR	1	3	3	NR	3	2	1	2	NR	NR	4	TENN.
NR	NR	2	3	3	3	3	2	1	3	2	1	4	TEX.
1	NR	1	3	3	3	3	2	1	3	2	1	NS	UTAH
1	NR	1	3	3	3	NR	2	1	2	2	1	NS	VT.
NR	NR	NR	3	3	NR	3	3	1	2	2	1	4	VA.
2	NR	1	3	3	3	NR	NR	1	1	2	1	4	WASH.
1	NR	1	3	3	3	3	2	1	NR	NR	NR	NS	W. VA.
1	NR	NR	3	3	3	3	2	1	NR	NR	NR	4	WISC.
1	NR	NR	3	3	3	NR	NR	NR	2	2	2	NS	WYOM.

TRUCK TIRE DATA

Maximum Loadings at Recommended Pressures*

TIRE SIZE	PLY RATING	MAXIMUM LOAD	RECOMMEND PRESSURE AT MAX. LOAD	TIRE SIZE	PLY RATING	MAXIMUM LOAD	RECOMMEND PRESSURE AT MAX. LOAD
6.50/17	6	1500	50	12.00/24	14	5925	75
6.50/18	6	1575	50	13.00/20	16	6275	75
6.50/20	6	1700	50	13.00/24	16	7025	75
7.00/17	6	1575	45	14.00/20	18	7650	80
7.00/17	8	1775	55	14.00/24	18	8525	80
7.00/18	8	1850	55				
7.00/20	8	2000	55				
7.50/17	8	2100	60				
7.50/18	8	2200	60				
7.50/20	8	2375	60				
8.25/17	10	2600	65				
8.25/18	10	2675	65				
8.25/20	10	2900	65				
9.00/18	10	3225	65				
9.00/20	10	3450	65				
10.00/18	12	3775	70				
10.00/20	12	4000	70				
10.00/22	12	4275	70				
10.00/24	12	4550	70				
11.00/20	12	4500	70				
11.00/22	12	4750	70				
11.00/24	12	5000	70				
12.00/20	14	5275	75				
12.00/22	14	5600	75				

*Data from the Tire and Rim Association, Inc.

LIGHT TRUCKS

6.00/16	6	1140	45
6.50/16	6	1290	45
7.00/15	6	1380	45
7.00/15	8	1555	55
7.00/16	6	1440	45
7.00/16	8	1620	55
7.50/15	8	1780	55
7.50/16	6	1650	45
7.50/16	8	1860	55
8.25/16	8	2000	45
8.25/16	10	2250	55
9.00/16	8	2250	45
9.00/16	10	2530	55
No. 15	6	1500	40
No. 15	8	1670	50

AASHO Standards

Recommended uniform standards submitted by American Association of State Highway Officials for width, height, length, speed and permissible loads

Uniform standards governing the maximum dimensions, weights and speeds of motor vehicles proposed by the Highway Transport Committee of the American Association of State Highway Officials, have been adopted by a letter ballot of the member State highway departments, with a recommendation that they be incorporated in the motor vehicle laws of all States.

The Association recommends that the standards be considered for adoption by all States in order to promote efficiency in the interstate operation of motor vehicles, increase the safety of highway transportation and establish a basis for regulation of the many relationships between the dimensions and weights of motor vehicles and the strengths and capacities of existing highways.

The standards, based upon years of research by State highway departments, and the Public Roads Administration, are advocated in lieu of recommendations previously made by the American Association of State Highway Officials on November 17, 1932, and of modified recommendations applicable during the war emergency period, which were adopted May 27, 1942.

The recommendations, as finally adopted, are as follows:

1. Width: No vehicle unladen or with load, shall have a total outside width in excess of 96 in. (Note: It is recognized that certain conditions inherent in the design of vehicles suggest the desirability of 102 in. as a standard of maximum width, but the existence of numerous bridges and a large mileage of highways too narrow for the safe accommodation of vehicles of such width precludes the present adoption of the higher standard of width. The State highway departments and Public Roads Administration are urged to give serious consideration to the desirability of eventual provision for the accommodation of vehicles

102 in. in width in planning the reconstruction of Federal-aid and State highways.)

2. Height: No vehicle, unladen or with load, shall exceed a height of 12 ft., 6 in.

3. Length: (a) No single truck, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 35 ft.

(b) No single bus, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 40 ft., provided that a bus in excess of 35 ft. in overall length shall have not less than 3 axles.

(c) No combination truck-tractor and semi-trailer, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 50 ft.

(d) No other combination of vehicles shall consist of more than two units, and no such combination of vehicles, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 60 ft.

4. Speed: (a) Minimum speed. No motor vehicle shall be unnecessarily driven at such slow speed as to impede or block the normal and reasonable movement of traffic. Exception to this requirement shall be recognized when reduced speed is necessary for safe operation or when a vehicle or combination of vehicles is necessarily or in compliance with law or police direction proceeding at reduced speed.

(b) Maximum speed: No truck shall be operated at a speed greater than 45 mph. Passenger vehicles may be operated at such speeds as shall be consistent at all times with safety and the proper use of roads.

(c) Vehicles equipped with solid rubber or cushion tires shall be operated at a speed not in excess of 10 mph.

5. Permissible Loads: (a) No axle shall carry a

load in excess of 18,000 lb. (Note: An axle load shall be defined as the total load transmitted to the road by all wheels whose centers may be included between two parallel transverse vertical planes 40 in. apart, extending across the full width of the vehicle.)

(b) No group of axles shall carry a load in pounds in excess of the value given in the following table corresponding to the distance in feet (col. a.) between the extreme axles of the group, measured longitudinally to the nearest foot:

(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
4	32,000	17	41,160	31	53,490	44	63,890
5	32,000	18	42,080	32	54,330	45	64,630
6	32,000	19	42,990	33	55,160	46	65,400
7	32,000	20	43,900	34	55,980	47	66,150
8	32,610	21	44,800	35	56,800	48	66,890
9	33,580	22	45,700	36	57,610	49	67,620
10	34,550	23	46,590	37	58,420	50	68,350
11	35,510	24	47,470	38	59,220	51	69,070
12	36,470	25	48,350	39	60,010	52	69,790
13	37,420	26	49,220	40	60,800	53	70,500
14	38,360	27	50,090	41	61,580	54	71,200
15	39,300	28	50,950	42	62,360	55	71,900
16	40,230	29	51,800	43	63,130	56	72,590
		30	52,650			57	73,280

(c) The maximum axle and axle-group loads recommended above are subject to reasonable reduction in the discretion of the appropriate highway authorities during periods when road subgrades have been weakened by water saturation or other cause.

(d) The operation of vehicles or combinations of vehicles having dimensions or weights in excess of the maximum limits herein recommended shall be permitted only if authorized by special certificate issued by an appropriate State authority.

'48 Trailer Registration

	House or Tourist	Commercial	Total-All Trailers
Alabama.....			8,557
Arizona.....	12,741	6,952	19,693
Arkansas.....	1,068	25,190	26,258
California.....			390,000
Colorado.....			17,113
Connecticut.....	12,951	6,542	19,493
Delaware.....			3,041
Dist. of Col.....			1,505
Florida.....	22,727	48,007	70,734
Georgia.....	18,188	8,903	27,071
Idaho.....			34,774
Illinois.....			8,114
Indiana.....	3,385	14,750	18,135
Iowa.....			134,169
Kansas.....			16,415
Kentucky.....			
Louisiana.....	1,599	28,671	30,270
Maine.....			17,974
Maryland.....			15,338
Massachusetts.....			46,417
Michigan.....	15,876	211,870	227,746
Minnesota.....	68,781	36,879	105,670
Mississippi.....	10,070	7,381	17,451
Missouri.....			68,000
Montana.....			6,148
Nebraska.....	3,050	7,200	10,250
Nevada.....			4,405
New Hampshire.....			9,248
New Jersey.....			23,984
New Mexico.....			5,000
New York.....			105,202
North Carolina.....			73,017
North Dakota.....	1,880		1,880
Ohio.....			188,000
Oklahoma.....	1,906	10,108	12,014
Oregon.....	9,873	9,602	19,475
Pennsylvania.....			81,885
Rhode Island.....			3,696
South Carolina.....			10,244
South Dakota.....			32,638
Tennessee.....			
Texas.....	15,000	110,000	125,000
Utah.....			1,550
Vermont.....			5,558
Virginia.....	20,844	9,913	30,757
Washington.....	2,807	55,217	58,024
West Virginia.....	7,732	915	8,647
Wisconsin.....	4,114	8,550	12,664
Wyoming.....			13,800

Total.....2,164,822

Compiled by Commercial Car Journal from material secured direct from the motor vehicle commissioners of the various states.

Trailer Production

by Type, by Year*

Type of Truck Trailer	1948	1947	1946
Vans			
Insulated and Refrigerated.....	2,277	1,852	3,384
Furniture.....	546	1,185	2,648
All Other Closed Top.....	18,368	18,601	26,590
Open Top.....	2,002	1,616	2,029
Total Vans.....	23,191	23,254	34,651
Platforms			
With Cattle and Stake Racks.....	1,590	3,369	8,183
With Grain Bodies.....	586	1,271	(1)
All Other.....	5,330	7,915	11,762
Total Platforms.....	7,506	12,555	19,945
Tanks			
Petroleum.....	3,176	3,019	2,231
All Other.....	374	411	395
Total Tanks.....	3,550	3,430	2,626
Pole and Logging			
Single Axle.....	2,059	3,815	5,970
Tandem Axle.....	1,605	1,541	1,598
Total.....	3,664	5,356	7,568
Low-bed Heavy Haulers	1,825	2,405	1,976
Off-Highway.....	689	808	619
Dump Trailers.....	2,469	622	697
All Other Trailers.....		1,365	2,537
Total Trailers.....	42,874	49,795	70,619
Trailer Chassis.....	1,952	3,301	5,615
Total Trailers and Chassis.....	44,826	53,096	76,234

(1)—Included with "All Other".
*Industry Division, Bureau of the Census.

Truck Trailer Production*

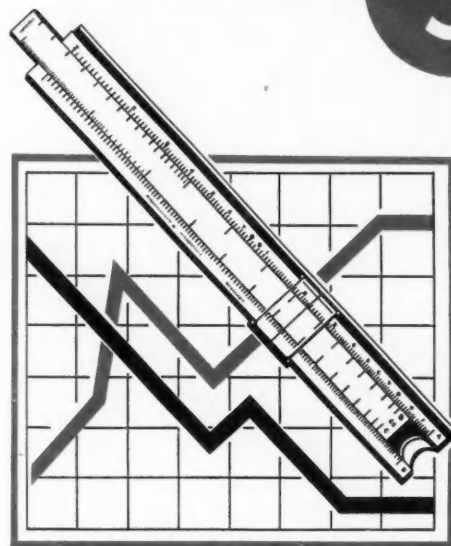
(Civilian)—by Years

1939.....	24,182	1942.....	8,408	1946.....	70,619
1940.....	27,118	1943.....	8,054	1947.....	49,795
1941.....	41,869	1944.....	24,092	1948.....	42,874
		1945.....	33,266		

*War Production Board and Bureau of the Census.

NINETEEN FORTY-NINE FLEET OPERATORS' REFERENCE ANNUAL

section 3



truck & trailer statistics

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NEW TRUCK REGISTRATIONS by MAKES, by G.V.W.—1946-1948

	5,000 lb. or less	5,001- 10,000	10,001- 14,000	14,001- 16,000	16,001- 19,500	19,501- 26,000	26,001 lb. and over	Total
AUTOCAR	1948 .....	.....	.....	.....	.....	2,770	2,770	2,770
	1947 .....	.....	.....	.....	.....	4,334	4,334	4,334
	1946 .....	.....	.....	.....	.....	2,033	2,722	4,755
BROCKWAY	1948 .....	.....	.....	370	239	1,606	743	2,958
	1947 .....	.....	.....	574	120	2,437	1,124	4,255
	1946 .....	.....	5	896	22	1,859	901	3,683
CHEVROLET	1948 124,689	72,143	32,651	72,756	.....	.....	.....	302,219
	1947 87,648	40,252	25,888	82,015	.....	.....	.....	235,803
	1946 73,097	6,980	42,533	49,008	.....	.....	.....	171,618
CROSLLEY	1948 2,411	.....	.....	.....	.....	.....	.....	2,411
	1947 .....	.....	.....	.....	.....	.....	.....	.....
	1946 .....	.....	.....	.....	.....	.....	.....	.....
DIAMOND T	1948	1,115	3,779	3,530	1,126	704	403	10,657
	1947	945	2,643	4,704	1,271	390	522	10,475
	1946	100	948	2,691	900	221	233	5,093
DIVCO	1948	4,678	940	.....	.....	.....	.....	5,618
	1947	3,636	1,257	.....	.....	.....	.....	4,893
	1946	2,942	792	.....	.....	.....	.....	3,734
DODGE	1948 42,097	28,710	978	29,777	11,377	1,492	.....	114,431
	1947 38,719	32,138	35,407	17,772	3,014	1,686	.....	126,736
	1946 43,482	11,831	29,688	11,246	202	41	.....	98,490
FEDERAL	1948 .....	.....	625	1,981	396	821	203	4,026
	1947 .....	.....	1,068	3,143	213	997	599	6,020
	1946 .....	.....	376	3,070	.....	561	550	4,557
FORD	1948 79,616	50,287	51,140	31,047	10,717	2,922	.....	225,729
	1947 46,365	33,533	85,057	21,459	.....	.....	.....	186,414
	1946 53,509	13,271	62,079	2,610	.....	.....	.....	131,469
F. W. D.	1948 .....	.....	.....	64	609	138	811	1,552
	1947 .....	.....	.....	140	699	356	1,195	2,290
	1946 .....	.....	.....	35	142	408	585	1,165
G. M. C.	1948 20,962	14,316	15,339	9,522	8,507	3,175	3,036	74,857
	1947 13,511	8,016	16,693	3,883	3,577	1,743	1,764	49,187
	1946 7,991	65	10,574	1,625	2,602	723	2,065	25,645
HUDSON	1948 117	.....	.....	.....	.....	.....	.....	117
	1947 2,534	.....	.....	.....	.....	.....	.....	2,534
	1946 2,543	.....	.....	.....	.....	.....	.....	2,543
INTERNATIONAL	1948 25,000	29,306	30,749	13,078	13,474	10,207	3,369	125,203
	1947 20,925	27,044	32,301	12,484	11,005	5,918	3,474	113,151
	1946 10,799	20,926	27,860	4,590	7,002	5,475	1,740	78,392
KENWORTH	1948 .....	.....	.....	.....	.....	478	478	478
	1947 .....	.....	.....	.....	.....	487	487	487
	1946 .....	.....	.....	.....	.....	.....	.....	.....
MACK	1948 .....	.....	.....	960	1,274	4,202	3,359	9,795
	1947 .....	.....	1	1,373	1,671	5,215	2,657	10,917
	1946 .....	.....	20	1,083	75	2,317	1,252	4,687
OSHKOSH	1948 .....	.....	.....	.....	.....	173	173	173
	1947 .....	.....	.....	.....	.....	17	228	245
	1946 .....	.....	.....	.....	.....	.....	.....	.....
REO	1948 .....	.....	3,953	4,684	1,404	246	486	10,773
	1947 .....	.....	7,017	1,777	2,280	1,065	772	12,911
	1946 .....	.....	5,005	3,775	401	448	860	10,489
STERLING	1948 .....	.....	.....	.....	.....	14	397	411
	1947 .....	.....	.....	.....	.....	46	530	576
	1946 .....	.....	.....	.....	.....	14	496	510
STUDEBAKER	1948 18,651	10,979	16,638	4,389	.....	.....	.....	50,657
	1947 20,271	6,271	12,366	2,953	.....	.....	.....	41,861
	1946 10,031	4,941	2,401	6,926	.....	.....	1,061	25,360
WARD LA FRANCE	1948 .....	.....	.....	.....	.....	22	249	271
	1947 .....	.....	.....	.....	.....	56	453	509
	1946 .....	.....	.....	.....	.....	.....	.....	.....
WHITE	1948 .....	.....	.....	1,005	423	8,701	1,474	11,603
	1947 .....	.....	899	399	1,828	8,534	1,426	13,088
	1946 .....	.....	1,369	30	1,483	5,343	1,892	10,117
WILLYS	1948 65,410	11,074	.....	.....	.....	.....	.....	76,484
	1947 48,427	1,392	.....	.....	.....	.....	.....	49,819
	1946 42,135	.....	.....	.....	.....	.....	.....	42,135
ALL OTHERS	1948 741	457	162	3	263	386	710	2,722
	1947 1,851	416	204	13	210	273	757	3,724
	1946 219	36	124	27	97	232	2,652	3,387
TOTAL	1948 379,674	223,065	158,954	173,102	49,264	35,107	18,008	1,035,174
	1947 278,251	153,643	220,801	152,549	25,329	29,076	19,483	879,132
	1946 243,806	61,092	183,774	87,577	12,759	19,409	16,832	625,249
% OF TOTAL	1948 36.68%	21.55%	15.16%	16.72%	4.76%	3.39%	1.74%	100%
	1947 31.65%	17.48%	25.12%	17.35%	2.88%	3.30%	2.22%	100%
	1946 38.99%	9.77%	29.39%	14.01%	2.04%	3.10%	2.70%	100%

*—Source of data:—R. L. Polk & Co.

TRUCK PRODUCTION by Makes—1946-48

	1946	1947	1948
Autocar	5,320	5,098	2,823
Brockway	4,212	4,742	2,919
Chevrolet	270,140	335,343	389,690
Federal	6,091	10,058	3,898
Ford	196,213	241,047	298,626
F. W. D.	1,644	2,103	1,077
G. M. C.	33,850	61,918	92,677
International	113,546	153,009	166,784
Oshkosh	273	328	231
Studebaker	43,196	67,811	67,982
White	12,542	18,479	12,507
Willys	71,455*	86,706*	104,631*
Total (All Makes)	758,482	986,642	1,143,845

* Includes all Jeeps

45 YEARS OF TRUCK AND BUS PRODUCTION*

Truck and Bus Factory Sales in Units and Their Value

Year	Units	Wholesale Value	Average Wholesale Price
1904	700	\$1,272,747	\$1,818
1905	750	1,330,000	1,773
1906	800	1,440,000	1,800
1907	1,000	1,780,000	1,780
1908	1,500	2,550,000	1,700
1909	3,297	5,333,683	1,618
1910	6,000	9,680,000	1,610
1911	10,681	21,000,000	1,966
1912	22,000	43,000,000	1,954
1913	23,500	44,000,000	1,872
1914	24,900	44,219,096	1,776
1915	74,000	125,800,000	1,700
1916	92,130	161,000,000	1,747
1917	128,157	220,982,668	1,724
1918	227,250	434,168,992	1,910
1919	224,731	371,422,820	1,653
1920	221,789	423,249,410	1,915
1921	148,052	166,070,810	1,122
1922	269,991	226,049,658	837
1923	409,295	308,537,929	754
1924	416,659	318,580,580	765
1925	530,659	458,400,277	864
1926	516,947	452,123,435	875
1927	484,793	420,130,624	904
1928	543,324	437,132,258	804
1929	771,020	566,029,644	734
1930	571,241	399,436,690	682
1931	416,648	262,417,542	630
1932	235,187	136,193,336	579
1933	346,545	186,069,314	537
1934	575,192	320,143,667	557
1935	694,690	379,407,751	546
1936	784,587	462,820,474	590
1937	893,065	534,494,873	598
1938	488,100	334,147,530	685
1939	710,496	494,829,231	696
1940	754,901	567,820,414	752
1941	1,060,820	1,069,799,855	1,008
1942	818,662	1,427,456,801	1,744
1943	699,669	1,451,794,475	2,076
1944	737,524	1,700,928,939	2,306
1945	655,663	1,181,955,532	1,803
1946	940,851	1,043,247,276	1,109
1947	1,239,642	1,708,622,000	1,378
1948	1,376,155	1,798,500,000	1,302
45 Years	19,233,823	\$20,715,350,331	\$1,077

*—Automobile Manufacturers Association.

TRUCK FLEETS by Vocational Use (Fleets operating 8 or more trucks)

	TOTAL
Bakeries, Candies	1,430
Bottlers, Breweries	1,020
Coal Mines & Dealers	890
Contractors, Builders & Suppliers	1,782
Dairy Products, Milk, Ice Cream Mfg.	1,746
Department Stores, Furniture and other Retailers	314
Motor Freight (Inter- & Intrastate)	6,152
Government (Federal, State, County, Municipal)	2,981
Ice Manufacturers & Dealers	482
Laundries, Cleaners, Dyers	1,214
Manufacturers	762
Meats, Grain, Frozen Foods, Produce, etc.	1,966
Oil, Gasoline, Greases	1,268
Public Utilities	2,592
Mining, Cement, Rock-Sand, etc.	360
Miscellaneous	584
TOTAL	25,543

U. S. TRUCK PRODUCTION by MAKES—1946-48

(Official Figures Submitted by Manufacturers)

AUTOCAR

G. V. W.	1946	1947	1948
Over 26,000	5,320	5,098	2,823

BROCKWAY

	1946	1947	1948
	4,212	4,742	2,919

CHEVROLET

(Total Truck Production)	1946	1947	1948
G. V. W.			
Under 5,000 (sedan del.)	4,189	20,478	20,089
Under 5,000 (1/2-ton)	82,432	76,940	110,446
5,001-10,000 (3/4 & 1-ton)	11,747	49,338	82,555
10,001-14,000 (1 1/2-ton)	27,873	25,235	35,600
14,001-16,000 (2-ton)	84,043	92,907	78,922
Total for Domestic Distribution	210,294	264,894	327,562
Total for Export	59,856	70,449	62,128
Grand Total Production (U. S. Plants)	270,140	335,343	389,690

FEDERAL

G. V. W.	1946	1947	1948
10,001-14,000	1,585	2,495	1,340
14,001-16,000	2,081	3,085	640
16,001-19,500	204	1,233	592
19,501-26,000	1,820	2,765	1,165
Over 26,000	401	480	181
Total	6,091	10,058	3,898

FORD

(U. S. Factory Sales of Trucks)	1946	1947	1948
G. V. W.			
5,000 and less	71,438	67,377	110,618
5,001-10,000	16,465	29,614	47,320
10,001-14,000	75,771	86,851	82,551
14,001-16,000	32,541	57,073	62,556
16,001-19,500		72	10,735
19,501-26,000			
Total	196,213	241,047	298,626

F.W.D.

G. V. W.	1946	1947	1948
16,001-19,500			121
19,500-26,000	654	1,310	385
Over 26,000	990	793	571
Total	1,644	2,103	1,077

G.M.C.

G. V. W.	1946	1947	1948
5,000 and less	9,929	14,308	24,410
5,001-10,000	654	10,938	16,848
10,001-14,000	13,620	18,181	20,237
14,001-16,000	4,322	5,441	13,108
16,001-19,500	3,093	5,679	11,740
19,501-26,000	954	3,356	3,289
Over 26,000	1,278	4,015	3,065
Total	33,850	61,918	92,677

INTERNATIONAL

G. V. W.	1946	1947	1948
Under 9,000	47,160	60,998	68,347
9,000 to 15,999	47,193	59,397	58,893
16,000 to 26,000	16,919	26,647	34,900
Over 26,000	2,274	5,967	4,644
Total	113,546	153,009	166,784

OSHKOSH

G. V. W.	1946	1947	1948
19,501 to 26,000	23	80	27
Over 26,000	250	268	204
Total	273	328	231

REO

G. V. W.	1946	1947	1948
14001-16000	9,528	12,041	7,833
16001-19500	5,882	6,784	2,583
19501-26000	1,333	1,516	420
Over 26,000		8	58
Total	16,743	20,349	10,894

STUDEBAKER

	1946	1947	1948
	43,196	67,811	67,982

WHITE

	1946	1947	1948
Commercial	12,642	18,479	12,507
Export (*)	(1,110)	(2,131)	(1,135)
Canada	309	948	549
Bus	633	1,066	743
Total	13,484	20,513	13,799

*—Export figures based on shipments. Export erections are included in Commercial erections, and this figure is shown here to give an idea of approximately how many of the Commercial jobs were for the Export Dept.

WILLYS

	1946	1947	1948
CJ-2A Jeeps	71,455	77,958	62,861
CJ-3A Jeeps			309
4-63 Panel		899	11,488
2-WD Trucks		3,734	8,859
4-WD Trucks		4,115	21,114
Total	71,455	86,706	104,631

1948 NEW TRUCK REGISTRATIONS by Makes by States*

STATE	Auto-car	Brock-way	Chev-rolet	Dia-mond T	Divoce	Dodge	Fed-eral	Ford	FWD	GMC	Inter-na-tional	Mack	Osh-kosh	Reo	Ster-ling	Stude-baker	Ward La France	White	Willys	All Others	Total	
Alabama	1		7855	78	26	2070	37	5096		1870	2452	160		245		928		151	1480	82	22,309	
Arizona			1795	10	26	796	15	1450		2	464	463	13	89		407		58	368	56	6,042	
Arkansas			6166	99	1	1654	28	4496		4	1241	1640	45	301		736	1	93	1767	18	18,289	
California	198	31	18020	411	438	9853	68	13274	75	6039	5896	298	9	233	91	4531	1	457	3624	688	64,008	
Colorado	7		3484	136	41	1317	59	2747	36	877	1757	19		83		521		64	1126	11	12,258	
Connecticut	119	137	2464	179	143	1036	100	1966	16	677	1213	227		90	9	518		107	830	72	9,903	
Delaware	13	14	892	24	18	445	3	785		1	271	416	24			134		31	123	30	3,238	
District of Columbia	24	20	1023	45	100	387	26	972			375	536	52		45	1	126		29	204	22	3,987
Florida	23		6718	140	34	2059	61	4495	4	1119	1740	196		135		923	2	183	1558	167	19,557	
Georgia	5	1	9377	260	6	2825	65	7013	3	1680	3195	222		307		1259		202	1926	61	28,207	
Idaho	1		2060	111	12	819	34	1588	4	661	1021	49		152		698	2	54	931	61	8,258	
Illinois	158	10	15814	1074	374	5659	206	9739	25	3110	8247	377		749	9	2504	4	658	3652	277	62,468	
Indiana	3	20	7229	282	173	2672	115	5566	8	2153	4177	128		288		1825		462	1903	192	27,198	
Iowa	2		7798	412	58	2722	29	5813	17	1469	4072	123	4	327		1253	2	234	1889	34	26,356	
Kansas	1	3	8023	230	23	2090	137	4901	4	1255	2709	31		270		1182		114	1213	60	22,246	
Kentucky	27		6375	269	49	1727	137	4723	1	1461	2536	85		357		822	8	113	3408	72	22,170	
Louisiana	4		5152	160	29	1533	15	4091	8	969	1706	87		105		736		103	1251	112	16,061	
Maine	4	21	2246	10	29	611	41	1736	1	667	966	76	1	140	6	383	1	21	516	21	7,497	
Maryland	59	99	4335	84	71	1478	83	2807	8	898	1810	190		154	5	544	4	134	665	39	13,267	
Massachusetts	159	146	4405	225	428	2134	46	4431	20	1171	2219	334	6	167	62	854	14	196	769	72	17,878	
Michigan	54	46	11082	208	385	5315	217	10311	6	3502	3317	157		420	1	1636	5	410	2392	124	39,568	
Minnesota	54	1	6733	286	90	2724	168	5382	42	1367	3699	126	12	208	9	1369	13	244	1406	61	23,996	
Mississippi			6288	96		1690	27	4337		1424	1784	125		168		712		85	1320	37	18,093	
Missouri	5	7	10644	204	153	3471	32	7237		2112	3600	89		227		1223	1	303	2218	85	31,611	
Montana	7		2658	183	14	987	79	2148	11	692	1430	29	2	186		563	5	64	1359	36	10,453	
Nebraska		3	4794	426	8	1721	35	3337	12	981	2611	83	1	91		841		133	1551	36	16,664	
Nevada		1	445	18	1	238	2	349	4	129	180	5		5		145		6	114	12	1,654	
New Hampshire	10	17	1121	19	42	432	11	899	1	264	432	72		44	5	169		21	263	16	3,838	
New Jersey	222	392	6374	402	425	2852	150	4805	22	2456	2987	637	1	193	10	1191	12	401	1733	152	25,219	
New Mexico	2		2183	53	4	599	21	1385	2	506	830	26		28		263		47	306	25	6,082	
New York	611	1066	14109	1134	902	8442	451	10893	123	5149	7848	1857	67	895	51	2852	153	1106	4232	505	62,446	
North Carolina	50	3	9437	105	63	3031	76	6721	135	1176	2404	524		231	2	1339		305	2197	255	28,054	
North Dakota			2201	152	1	739	67	1904	7	418	1451	51	2	73		485		28	700	4	6,283	
Ohio	135	22	13306	383	421	5583	231	10239	27	3618	6364	401		501	1	2153	6	958	3155	261	47,755	
Oklahoma	4		7276	65	46	2122	26	5464	53	1245	3126	53		245		908	1	168	1698	44	22,544	
Oregon	67	1	3883	114	24	2040	67	2772	6	1432	1912	137		117	34	993		186	1405	370	15,560	
Pennsylvania	425	780	15134	757	139	7356	320	12295	12	4900	7270	1253	25	712	51	3137	8	1241	4136	340	60,271	
Rhode Island	105	26	1119	76	148	556	10	839		307	664	61	2	72	7	222		83	260	43	4,600	
South Carolina	2		4744	46	5	1294	19	2968		762	973	103		117		482		106	863	53	12,536	
South Dakota			1842	181	5	810	44	1398		446	1893	19		107		394		29	979	25	7,872	
Tennessee	8	5	8620	182	39	2372	156	5918	3	2375	3235	206		288		1139		283	1816	111	26,756	
Texas	65	20	21996	399	174	7269	111	15330	7	4493	8102	378		463		3043	2	789	5295	821	67,737	
Utah			1607	96	21	617	31	1300	6	532	735	38		46		356		42	486	55	5,968	
Vermont	6	18	1012	26	18	338	23	924	1	345	614	54	6	60	3	261	10	31	517	25	4,294	
Virginia	47	28	7609	137	89	2238	115	6226	6	1479	2261	160		180		993	2	235	1634	91	23,530	
Washington	20		4499	156	137	2119	28	4221	11	1385	2228	120		350	28	1090		358	1097	208	16,054	
West Virginia	24	40	3202	83	33	1331	94	2518	7	1135	1033	154		139	1	452	7	170	1612	47	12,062	
Wisconsin	34		6704	318	168	2596	104	4945	63	1530	3511	132	35	320	17	1092	3	308	1682	76	23,366	
Wyoming	2		1268	114	4	502	8	975	7	246	648			36		267	4	21	734	20	4,853	
Total	1948	2770	2986	302210	10657	5618	114431	4026	226729	811	74857	125203	9795	173	10773	50657	271	11803	76494	5728	1,035,174	
Total	1947	4334	4255	235803	10475	4893	126736	5020	186414	1195	49187	113151	10917	245	12911	41861	509	13086	49819	6745	879,132	

NEW TRUCK REGISTRATIONS by Makes by States* For January, 1949

STATE	Auto-car	Brook-way	Chevrolet	Diamond T	Divco	Dodge	Federal	Ford	FWD	GMC	International	Ken-worth	Mack	Pontiac	Reo	Sterling	Stude-baker	White	Willys	All Others	Total
Alabama	January		680	3		150	1	223		94	119		9		9		110	10	76	9	1,502
Arizona	January		136	1		39	2	67		25	25				3	2	36	2	21	13	372
Arkansas	January		805	7		199		425		164	135		2		23		162	7	179	7	2,118
California	January	9	10	1513	25	50	830	5	789	2	501	350	8	22		18	397	30	125	26	4,720
Colorado	January		232	5	1	113		137		74	84				2		57	6	70	2	783
Connecticut	January	4	8	167	12	3		62	1	32	66		13		4		36		33	3	499
Delaware	January		81	1	1	34		57		23	27						13		9	1	256
Dist. of Columbia	January	10		56	4	2		61		14	32		4				6	10	3	4	250
Florida	January	1		396	15	3	118	2	231		82	154	20		5		76	10	75	6	1,188
Georgia	January	1	1	959	12		356	3	608		178	277	15		17		189	19	158	8	2,799
Idaho	January	1		108	7		38		58		34	35	1		3		35	1	41	10	372
Illinois	January	9		886	61	32	389	9	523	2	209	482	16		29	2	187	81	130	15	3,182
Indiana	January			431	8	22	143	1	291		125	256	7		13		155	22	60	4	1,536
Iowa	January			560	20	8	207		291		84	234	11	1	8		115	11	82	8	1,630
Kansas	January			341	5		128	4	194		71	146			3		67	2	39	2	1,002
Kentucky	January	1		426	11	3	130	1	230	1	82	134		4	9		72	8	154	3	1,209
Louisiana	January																				
Maine	January	4	3	223	1	1	68	1	137		60	81		4	11		35	10	39	5	883
Maryland	January	4	8	238	7	3	123	3	133		43	78		3	2		46	4	30	2	727
Massachusetts	January	17	10	266	2	11	115	3	192	4	41	97		15	14		43	20	41	5	904
Michigan	January	6	1	944	14	16	306	10	392		151	218		13	8		127	19	99	16	2,340
Minnesota	January	16		396	4	10	171	3	305	1	144	306	5	11	2		120	6	55	8	1,588
Mississippi	January			499	8		145		199		109	127		3	7		61	4	83	3	1,248
Missouri	January	1		727	10	3	269		349		161	217		4	14		107	18	109	11	2,000
Montana	January			196	12		83	2	129	1	81	116		1	8		53	1	122	1	806
Nebraska	January			332	35		139	3	162	1	79	204	3	2	3		86	9	90	16	1,164
Nevada	January			43			15		15		10	11			1		23		10		128
New Hampshire	January		1	50			15	1	26		8	17		1			3		7		129
New Jersey	January	20	33	423	12	15	216	11	228	2	142	158		41	13		69	48	113	13	1,557
New Mexico	January			67	1		26		43		18	13					19		9	3	221
New York	January																				
North Carolina	January	4		833	7		204	3	404		86	220		13	7		112	20	113	16	2,042
North Dakota	January			149	13	1	61	1	154		50	147			1		45	1	32	2	657
Ohio	January	11	4	997	22	28	428	11	533		120	350		25	11		171	72	85	22	2,890
Oklahoma	January			287	3	2	120	1	200		53	128		1	2		64	12	54	4	631
Oregon	January	3		239	3	2	126	2	176		72	67	2	4	2		68	3	85	5	859
Pennsylvania	January	25	28	727	27	4	469	7	537		229	335		52	21		232	48	156	26	2,923
Rhode Island	January	3		71		2	32		41		7	34		1			13	5	9		216
South Carolina	January	1		416	4		106		171		52	92		23	1		52	8	47		973
South Dakota	January			119	20	1	52		66	3	33	123					41		49	5	502
Tennessee	January			803	6		230	1	284		123	166		1	11		112	10	56	5	1,808
Texas	January	7		1642	14	10	550	6	856		367	460	2	14	8		288	37	287	64	4,562
Utah	January			87	1		29	1	75	2	36	33		1	3		26	2	20	3	319
Vermont	January			65	1		28		42		19	30			2		17	2	10	1	217
Virginia	January	3	2	580	7		162	2	299		85	125		6	2		99	9	73	6	1,449
Washington	January	3		293	7	7	130	1	182		87	132	9	4	7	4	74	7	69	7	1,023
West Virginia	January			211	1	3	115		126		39	63		3	3		37	10	98	1	711
Wisconsin	January	4		474	17	11	168	5	280	10	116	239		11	24		102	22	87	13	1,583
Wyoming	January			80	13		25	1	52	1	9	36			1		23	1	26	1	289
Total	January, 1948	169	110	20343	469	255	7718	107	11035	31	4422	6981	30	380	334		4081	634	3386	387	60,897
Total	January, 1948	215	170	21450	616	427	6467	349	6571	74	4805	8897	39	674	856	22	3537	865	4474	392	60,968

* Data from R. L. Polk & Co.

TRUCK FLEETS—by SIZE, by STATES (Fleets operating 8 or more trucks)

STATE	Total Fleets	NUMBER OF TRUCKS OPERATED			STATE	Total Fleets	NUMBER OF TRUCKS OPERATED		
		8 to 24	25 to 49	50 and Over			8 to 24	25 to 49	50 and Over
Alabama.....	332	145	77	100	Nebraska.....	245	138	51	56
Arizona.....	80	36	21	23	Nevada.....	38	8	23	7
Arkansas.....	159	85	34	40	New Hampshire.....	98	62	23	13
California.....	1,652	701	347	604	New Jersey.....	1,026	598	209	219
Colorado.....	271	166	42	73	New Mexico.....	71	37	17	17
Connecticut.....	475	301	102	72	New York.....	2,325	1,233	447	645
Delaware.....	86	42	17	27	N. Carolina.....	497	279	79	139
Dist. of Columbia.....	217	86	46	85	N. Dakota.....	64	42	12	10
Florida.....	395	176	92	127	Ohio.....	1,637	931	313	393
Georgia.....	378	208	71	99	Oklahoma.....	359	196	74	87
Idaho.....	74	37	16	21	Oregon.....	308	168	70	70
Illinois.....	1,634	879	327	431	Pennsylvania.....	2,361	1,408	446	507
Indiana.....	707	405	159	143	Rhode Island.....	228	147	41	40
Iowa.....	409	269	91	49	S. Carolina.....	206	122	50	34
Kansas.....	271	176	53	42	S. Dakota.....	71	40	11	20
Kentucky.....	277	161	62	54	Tennessee.....	413	223	82	106
Louisiana.....	421	252	80	89	Texas.....	1,088	537	192	328
Maine.....	159	85	37	27	Utah.....	141	69	25	47
Maryland.....	468	254	89	125	Vermont.....	49	31	5	12
Massachusetts.....	1,214	790	219	205	Virginia.....	461	242	93	126
Michigan.....	1,162	643	239	200	Washington.....	523	286	94	143
Minnesota.....	516	252	117	146	West Virginia.....	337	192	71	74
Mississippi.....	110	63	16	31	Wisconsin.....	679	372	134	173
Missouri.....	705	376	133	196	Wyoming.....	64	37	18	9
Montana.....	124	69	27	28					
					TOTAL.....	25,543	14,054	5,094	6,385

TRUCK & TRAILER STATISTICS

TOTAL TRUCK REGISTRATIONS *by STATES*

	1946	1947	1948	1945	1944	1943	1942	1941	1940
Alabama.....	127,065	108,251	88,441	72,141	67,723	65,808	65,025	65,909	55,707
Arizona.....	48,647	42,295	38,044	29,482	27,211	27,020	28,093	26,889	25,243
Arkansas.....	125,161	112,157	84,450	78,902	74,459	71,916	75,267	77,191	66,158
California.....	531,800†	487,929†	408,729†	355,282†	327,735†	327,204†	344,565†	350,261†	326,998†
Colorado.....	115,006	101,953	90,543	76,337	70,524	68,887	31,784	31,044	30,298
Connecticut.....	75,891	76,432	75,266	58,861	60,895	61,423	54,918	79,250	74,456
Delaware.....	17,557	15,913	14,296	13,162	14,371*	13,576	13,416	13,969	11,030
Dist. of Col.....	16,389	15,588	14,495	13,879	13,563	15,037	14,646	13,809	13,929
Florida.....	156,639	138,373	120,525	96,384	88,053	94,132	80,919	87,706	79,790
Georgia.....	167,525	150,108	128,403	104,650	97,553	93,817	96,655	99,506	61,321
Idaho.....	59,644	50,877	40,000	38,352	35,533	35,724	34,807	36,515	33,538
Illinois.....	315,980	282,125	253,365	224,926	216,930	221,634	233,386	234,703	228,899
Indiana.....	200,000	197,418	163,859	137,809	137,252	124,195	138,648	135,834	134,215
Iowa.....	150,973	133,868	115,964	102,176	98,373	103,509	103,487	108,985	101,244
Kansas.....	163,733	167,366	147,296	129,353	121,819	119,168	119,725	113,872	102,665
Kentucky.....	137,711	118,461	101,541	82,017	76,603	73,107	77,412	81,863	75,891
Louisiana.....	122,935	105,958	95,117	75,256	72,015	70,691	73,659	81,305	61,793
Maine.....	62,210	61,001	56,769	49,591	44,527	41,999	42,074	45,748	43,914
Maryland.....	90,935	82,611	81,649	65,080	53,316	61,672	60,627	60,876	58,180
Massachusetts.....	151,809	144,113	131,071	111,417	103,806	104,253	109,763	110,650	109,482
Michigan.....	258,689	222,560	194,546	167,877	156,174	159,656	151,053	163,284	152,735
Minnesota.....	163,756	148,644	130,946	115,906	113,686	116,026	123,213	129,719	124,602
Mississippi.....	117,537	98,390	85,536	68,988	65,780	60,900	61,741	64,119	60,927
Missouri.....	215,000	209,997	188,394	157,084	143,567	148,608	159,341	164,546	152,924
Montana.....	70,391	63,671	54,947	48,260	46,730	45,380	46,695	51,476	47,964
Nebraska.....	105,750	98,296	87,121	75,554	72,544	71,726	70,323	71,283	68,016
Nevada.....	13,417	12,585	10,778	9,193	9,520	9,850	10,037	9,524	8,571
New Hampshire.....	31,623	35,663	28,872	23,483	27,240	27,195	32,569	32,116	30,062
New Jersey.....	199,260	186,794	167,506	149,000	138,937	135,529	140,928	141,329	137,126
New Mexico.....	44,000	41,062	35,179	29,640	27,826	28,645	28,559	30,806	30,090
New York.....	418,416	425,323	370,709	354,052	282,091	310,258	330,323	348,819	363,110
North Carolina.....	167,824	147,703	123,748	87,500	83,063	95,600	83,922	96,320	87,457
North Dakota.....	68,919	60,777	53,868	49,282	46,946	44,397	41,935	40,788	37,019
Ohio.....	237,000	270,284	242,603	196,810	144,484	185,596	193,325	192,000	190,654
Oklahoma.....	162,941	143,078	128,124	109,896	102,383	101,969	109,586	107,903	103,391
Oregon.....	115,648	115,845*	99,025	82,408	77,773	74,724	75,217	75,538	67,756
Pennsylvania.....	416,500	407,591	342,172	304,872	276,072	276,052	274,745	274,967	263,112
Rhode Island.....	29,682	28,413	26,959	22,607	20,985	20,575	21,076	21,174	20,743
South Carolina.....	91,849	85,376	64,168	48,047	45,701	47,257	48,341	50,638	39,070
South Dakota.....	60,165	50,545	42,163	37,149	35,580	35,028	34,856	34,952	32,296
Tennessee.....	136,302	124,826	99,517	77,134	73,850	71,701	74,285	81,022	70,987
Texas.....	526,000	437,706	379,158	307,555	286,689	287,223	297,526	368,863	350,206
Utah.....	39,637	37,148	31,267	26,748	25,836	25,549	24,905	24,208	23,534
Vermont.....	15,355	14,618	13,570	11,667	10,806	10,207	9,858	10,327	9,628
Virginia.....	146,058	132,086	116,064	94,286	82,912	80,876	83,048	83,594	74,720
Washington.....	145,784	133,102	117,173	103,782	96,168	94,042	93,517	94,772	93,395
West Virginia.....	88,217	76,940	66,612	55,512	51,381	47,124	49,321	49,541	51,520
Wisconsin.....	196,503	181,443	160,940	142,240	139,186	135,643	143,087	158,087	147,661
Wyoming.....	31,488	27,341	24,105	21,436	20,472	20,014	20,192	20,474	19,062
TOTAL.....	7,170,901	6,612,922	5,749,643	4,908,778	4,516,157	4,549,882	4,644,203	4,859,682	4,804,722

†—Includes light commercial vehicles registered as passenger cars. *—Includes trailers for 1947 and all previous years.
 ‡—Large increase due to change in classification of trucks previously registered as passenger cars.

TOTAL U. S. TRUCK REGISTRATIONS, *by YEARS* 1904-1948

Year	Units	% Gain	Year	Units	% Gain	Year	Units	% Gain	Year	Units	% Gain	Year	Units	% Gain
1904.....	410	..	1913.....	63,800	54	1922.....	1,375,725	23	1931.....	3,486,571	-0.6	1940.....	4,604,722	4.2
1905.....	600	46	1914.....	85,600	34	1923.....	1,612,569	17	1932.....	3,229,315	-0.7	1941.....	4,859,682	5.5
1906.....	1,100	83	1915.....	136,000	59	1924.....	2,134,724	32	1933.....	3,227,357	-0.6	1942.....	4,644,203	-4.4
1907.....	1,700	55	1916.....	215,000	58	1925.....	2,440,854	14	1934.....	3,409,335	5.5	1943.....	4,549,682	-2.0
1908.....	3,100	82	1917.....	326,000	52	1926.....	2,764,222	13	1935.....	3,655,705	7.1	1944.....	4,516,157	-0.7
1909.....	6,050	95	1918.....	525,000	61	1927.....	2,914,019	5	1936.....	3,981,755	9.1	1945.....	4,908,778	8.8
1910.....	10,000	65	1919.....	794,372	51	1928.....	3,113,999	7	1937.....	4,107,244	3.1	1946.....	5,749,643	17.1
1911.....	20,000	100	1920.....	1,006,082	27	1929.....	3,379,854	8	1938.....	4,210,022	2.5	1947.....	6,612,922	15.0
1912.....	41,400	107	1921.....	1,117,100	11	1930.....	3,486,019	3	1939.....	4,419,893	5.0	1948.....	7,170,901	8.4

NEW TRUCK REGISTRATIONS *by MONTHS, by YEARS*

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
1940.....	45,650	41,338	53,093	55,982	51,553	43,504	50,913	48,980	39,224	48,356	46,618	51,095	576,327	1940
1941.....	50,830	50,124	62,413	64,238	64,177	62,265	67,412	56,191	43,892	41,352	36,799	41,006	640,686	1941
1942.....	23,356	10,311	9,453	5,613	7,474	5,433	3,718	3,338	2,683	2,310	1,842	1,891	177,422	1942†
1943.....	2,249	3,675	4,632	5,142	6,109	5,792	7,516	8,360	7,346	5,564	4,411	1,673	162,469	1943†
1944.....	6,746	5,450	5,746	8,387	11,629	12,795	7,575	13,265	11,619	10,899	12,106	15,052	121,269	1944†
1945.....	15,455	16,519	15,638	14,359	21,184	22,958	25,098	128,000	194,397	133,535	142,567	121,222	1,350,932	1945†
1946.....	62,477	63,782	79,344	85,148	76,001	65,458	71,647	75,912	69,899	87,167	73,737	67,890	876,132	1946
1947.....	69,488	74,326	84,806	106,168	100,614	87,324	94,036	91,923	85,108	84,284	75,024	70,282	1,035,174	1947
1948.....														1948

†—R. L. Polk & Co. new registrations for first three months of 1942. Remainder of 1942 and entire years of 1943, 1944 and 1945 are Commercial Trucks Rationed on Government Exemptions Permits and Certificates of Transfer by W.P.B. and O.D.T. It is assumed that all certificates were cashed.
 ‡—Estimated by Automobile Manufacturers Association. §—Revised. *—Total for Jan., Feb., and March.

TRUCK & TRAILER STATISTICS

TRUCK FACTORY SALES by Gross Vehicle Weights*

Total Factory Sales from U. S. Plants

	5,000 lb. & Less	5,001-10,000	10,001-14,000	14,001-16,000	16,001-19,500	19,501-26,000	Over 26,000	Total
1946.....	485,088	287,720	182,500	280,535	76,711	50,023	21,279	1,363,856
Per Cent.....	35.57	19.63	13.38	20.57	5.62	3.67	1.56	100%
1947.....	375,445	182,490	265,989	285,589	41,606	42,761	26,754	1,220,634
Per Cent.....	30.76	14.95	21.79	23.40	3.41	3.50	2.19	100%
1948.....	330,730	88,235	247,912	200,574	24,162	25,252	13,674	930,739
Per Cent.....	35.53	9.48	26.64	21.55	2.60	2.71	1.49	100%

Factory Sales for Domestic Use

1946.....	420,531	244,894	150,340	217,695	64,297	45,120	19,712	1,162,589
Per Cent.....	36.17	21.06	12.93	18.73	5.53	3.88	1.70	100%
1947.....	314,862	165,707	197,275	196,705	34,660	36,723	23,673	971,605
Per Cent.....	32.39	17.05	20.30	20.45	3.57	3.78	2.46	100%
1948.....	291,827	78,925	182,000	137,054	19,293	22,474	13,058	744,631
Per Cent.....	39.19	10.60	24.44	18.41	2.59	3.02	1.75	100%

*Basic data from Automobile Manufacturers Association.

NEW TRUCK REGISTRATIONS by MAKES, by YEARS*

	1948	1947	1946	1945†	1944	1940
Autocar.....	2,770	4,334	4,755	319	2,510	1,955
Brockway.....	2,956	4,255	3,683	171	2,294	1,672
Chevrolet.....	302,219	235,803	171,619	11,250	212,797	194,038
Crosley.....	2,411					
Diamond T.....	10,857	10,475	5,093	530	6,077	6,358
Divco.....	5,618	4,893	3,734	180	2,306	1,662
Dodge.....	114,431	126,736	96,490	4,736	62,925	54,61
Federal.....	4,028	6,020	4,557	175	1,611	1,615
Ford.....	225,729	186,414	131,469	11,050	174,024	162,337
F. W. D.....	611	1,195	585	75	280	252
G. M. C.....	74,857	49,187	25,645	3,429	7,703	42,436
Hudson.....	117	2,534	2,543	33	736	761
International.....	125,203	113,151	78,392	7,316	92,482	77,891
Kenworth.....	476	467				
Mack.....	9,705	10,917	4,687	767	9,468	7,754
Nash.....	32					
Oshkosh.....	173	245				
Plymouth.....			28	137	7,732	9,573
Reo.....	10,773	12,911	10,489	156	1,543	625
Sterling.....	411	576	510	37	400	341
Studebaker.....	50,657	41,861	25,360	394	5,078	1,207
Ward La France.....	271	509				
White.....	11,603	13,086	10,117	933	9,271	7,344
Willys-Jeep.....	48,644	47,612	42,135	99	2,031	2,291
Willys-Truck.....	27,840	2,207				
All Others.....	2,690	3,724	3,359	158	1,429	1,552
Total.....	1,035,174	879,132	625,249	41,944	640,697	576,327

†—Data for first three months of 1942 only. Also does not include returns from Connecticut for month of March.

*—Data from R. L. Polk & Co. No data were collected for the last 9 months of 1942 and the war years of 1943, 1944 and 1945.

U. S. TRUCK PRODUCTION by MONTHS, by YEARS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1940.....	68,356	63,709	68,280	67,764	63,255	56,562	62,187	28,995	44,147	70,447	76,841	84,378	754,901
1941.....	86,436	87,824	94,106	85,395	97,115	97,884	97,877	65,383	68,480	81,478	93,128	105,734	1,060,820
1942.....	93,161	77,269	89,537	64,157	61,064	73,732	63,885	59,526	59,857	56,743	51,628	54,685	805,264
1943.....	49,612	47,546	55,979	56,173	55,190	56,516	60,285	61,321	57,582	60,160	57,168	59,583	677,115
1944.....	58,827	55,916	56,695	56,071	57,287	61,479	61,921	69,015	65,605	64,723	69,497	72,165	749,201
1945.....	67,394	64,510	75,057	67,579	71,267	66,466	54,563	44,779	31,572	42,225	53,634	29,542	668,578
1946.....	45,500	35,258	38,193	61,719	76,162	60,812	88,453	98,948	96,515	108,141	102,075	109,054	940,830
1947.....	101,091	106,345	119,655	108,634	98,283	93,248	98,561	88,251	112,327	120,032	89,027	103,188	1,239,642
1948.....	100,582	106,155	142,036	130,019	113,077	118,640	117,792	112,531	112,367	108,048	104,382	106,526	1,376,155

*—Bureau of the Census data for 1933 through 1941, representing Factory Sales. W.P.B. records for 1942 through 1945. Automobile Manufacturers Association 1946 through 1948.

†—These data cover actual production of trucks for military and civilian use.

Truck Dealers, Wholesalers, Independent Repair Shops*

(As of January of Each Year.)

	Wholesale	Total Truck Dealers	Independent Repair Shops
1928.....	3,796	23,869	37,615
1929.....	3,912	24,068	43,963
1930.....	4,028	25,436	47,862
1931.....	4,668	26,137	53,696
1932.....	5,051	25,952	59,646
1933.....	5,337	23,746	65,647
1934.....	5,430		69,518
1935.....	5,767		69,518
1936.....	5,905	23,045	69,518
1937.....	5,874	24,853	69,518
1938.....	5,934	27,246	69,518
1939.....	6,019	26,909	69,518
1940.....	6,176	24,575	69,518
1941.....	6,575	24,992	69,518
1942.....	6,631	32,291	69,518
1943.....	6,130	27,820	69,518
1944.....	6,101		69,518
1945.....	6,217	26,370	69,518
1946.....	6,612	27,159	69,518
1947.....	7,328	29,397	69,518
1948.....	7,982	25,961	69,518
1949.....	8,338	27,574	69,518

†—Reduction in truck dealers due to discontinuance of Plymouth truck production.

*—Trade List Department, Chilton Company.

Wholesale Value of Repair Parts and Accessories Production*

Year	Wholesale Value	Year	Wholesale Value
1933.....	\$234,461,000	1941.....	\$718,212,000
1934.....	304,642,000	1942.....	471,957,000
1935.....	378,323,000	1943.....	527,710,000
1936.....	448,327,000	1944.....	616,724,000
1937.....	464,619,000	1945.....	1,284,928,000
1938.....	348,068,000	1946.....	1,792,918,000
1939.....	454,673,000	1947.....	2,395,323,000
1940.....	553,004,000	1948.....	2,620,000,000

*Estimated on basis of excise tax receipts.

NEW TRUCK REGISTRATIONS by YEARS*

Year	Units
1927.....	327,965
1928.....	341,123
1929.....	527,057
1930.....	410,699
1931.....	313,884
1932.....	180,413
1933.....	245,869
1934.....	403,886
1935.....	510,683
1936.....	611,644
1937.....	618,249
1938.....	365,349
1939.....	486,748
1940.....	559,150
1941.....	640,697
1942.....	77,422
1943.....	62,469
1944.....	121,269
1945.....	350,932
1946.....	625,249
1947.....	879,132
1948.....	1,035,174

* Sources: 1926 through March, 1942, and 1946 and later years compiled by R. L. Polk & Co. April, 1942 through July, 1945 data are W.P.B. and O.D.T. and represent certificates of transfer issued to civilian users.

Truck Specifications Table

OF CURRENT PRODUCTION MODELS

DATA SUPPLIED BY MANUFACTURERS AND TABULATED BY
COMMERCIAL CAR JOURNAL

Key to Definitions, References and Abbreviations

DEFINITIONS

MAKE AND MODEL

Only Domestic Truck Models are listed.

OPTIONAL UNITS

For the express purpose of best fitting the truck to the individual job most of the models listed can be provided with optional engines, transmissions, axles, etc., and these models not so equipped are considered standard stock models.

CHASSIS LIST PRICE

The chassis list price applies to the minimum standard wheelbase with standard tires and standard equipment. All prices are F.O.B. factory. Chassis list price does not include the price of the Cab unless otherwise noted.

RECOMMENDED GROSS VEHICLE WEIGHT FOR NORMAL SERVICE

The Gross Weights published herewith are those supplied by manufacturers as their Recommended Gross Vehicle Weights for Normal Operating Conditions, and are based upon the Maximum Authorized Tire Size listed. In actual practice the manufacturer may either increase or decrease the gross vehicle weight rating when either favorable or

unfavorable operating conditions are involved. Since the proper performance of a motor truck depends upon many factors, including grades, road conditions, etc., the gross weights that a manufacturer is prepared to recommend will vary with particular conditions, and the manufacturer's own standard of safety factors. Specific recommendations, therefore, should be obtained from the manufacturer's representative.

CHASSIS WEIGHT

The chassis weight listed includes the weight of the minimum standard wheelbase chassis, with cowl, with standard tires, with standard equipment, with crankcase and cooling system full, and 5 gallons of fuel in the tank. It does not include the weight of the Cab. This applies to C.O.E. as well as conventional chassis types. Exceptions are noted.

STANDARD TIRE SIZE

The standard tire size listed is that which is included in the Chassis List Price.

MAXIMUM AUTHORIZED TIRE SIZE

The tire size listed in this column is the maximum size recommended by the manufacturer of the chassis for the Gross Vehicle Weight for Normal Operating Conditions. It is furnished at extra cost, if it differs from the standard size. Dual rears are understood; exceptions noted.

MINIMUM STANDARD WHEELBASE

The minimum standard wheelbase is the so-called standard wheelbase on which the Chassis List Price is based.

MAXIMUM STANDARD WHEELBASE

The maximum standard wheelbase is the extreme end of the standard range of wheelbases offered by the chassis maker.

MAXIMUM BRAKE HP.

Maximum Brake Horsepower at Given R.P.M. is actual dynamometer reading without accessories.

GEAR RATIO RANGE

Gear Ratio Range in High—Ratio within the range given are available at no extra cost. Exceptions are noted.

TRACTORS

Unless given the designation (N)—meaning not available as a tractor—all standard models may be assumed to be available as tractors. Exclusively Tractor models are designated (T).

KEY TO REFERENCES

c.f.—Cab Forward design.
 c.o.e.—Cab-Over-Engine design.
 (D)—Diesel-engine equipped.
 (T)—Designed for tractor use only.
 (C)—Converted Ford or Chevrolet Model.

(2) International Harvester—Specifications shown represent only the basic standard chassis units and standard chassis ratings in keeping with definitions established by Commercial Car Journal. Optional units not shown such as engines, clutches, transmissions, axles or axle ratios, brakes, wheels and tires, frames or frame reinforcements, optional wheelbases or any other units which make up part of the truck chassis and which International will furnish and approve from the factory as optional equipment can or will change either the ratings, chassis weight shown or performance of the truck as indicated by this list.

Also the company reserves the privileges of assigning special gross vehicle ratings for any chassis providing in the opinion of its engineering department, the type of service justifies the new rating w. h. out decreasing the safety factor designed into the truck.

(a)—Available with Two-Speed Axle designated KBS Models.

KEY TO ABBREVIATIONS

MAKES—ALL

B—Bendix
 BL—Brown-Lipe.
 Bu or Bud—Buda.
 BW—Bendix-Westinghouse
 C—Chevrolet.
 Cl or Cla—Clark.
 Con—Continental.
 Cum—Cummins-Diesel.
 Eat—Eaton.
 F—Ford.
 Fu—Fuller.
 H—Hotchkiss.
 Her—Hercules.
 HS—Hall-Scott.
 L—Lockheed.
 LH—Lockheed front, Wagner "hi-Tork" rear.
 LW—Lockheed front, Wisconsin rear.
 M—Midland.
 N.P.—New Process.
 O or Ow—Owen.
 Op or Opt—Optional.
 Shu—Shuler.
 Spl—Spicer.
 T or Tim—Timken-Detroit Axle Co.
 Tw—Timken-Detroit—Westinghouse.
 TW—Timken-Detroit—Wisconsin.
 WG—Warner Gear.
 Wau—Waukesha.
 W or Wis—Wisconsin.
 Wg—Wagner.
 Ws—Westinghouse.
 WW—Westinghouse or Wagner

WHEELS DRIVEN

2F—Forward unit of Rear Axle Group.
 2R—Rear Unit of Rear Axle Group
 4R—Forward and rear units of Rear Axle Group.
 —All wheels.

BRAKES—SERVICE

Location

4—Four Wheels, front and rear.
 4r—Four Wheels, rear only.

Type

I—Internal.
 X—External

Operation

A—Air.
 H—Hydraulic.
 V—Vacuum.
 D or Dp—Dual Primary

BRAKES—HAND

Location

C—Center of double propeller shaft.
 2—Rear wheels.
 4—Four wheels.
 6—Six wheels.
 P—Back of Power Divider.
 J—Jackshaft.
 T—Transmission.
 F—Driveshaft.

Type

D—Tru-Stop disk.
 I—Internal.
 M—Mechanical.
 X—External.
 PD—Two drums on rear of power divider.

BRAKE DRUMS

Material

a—Cast alloy iron.
 A—American Car Foundry.
 c—Cast iron.
 Cc—Composite Front, Cast Iron in rear.
 Ce—Centrifuge.
 Cl—Copper iron.
 Co—Composite.
 D—Dayton.
 E—Ermalite.
 G—Gunite.
 N—Nickel iron.
 S—Steel.

(Where a combination of any of the above is used, the first reference mark applies to the front and the second to the rear drums.)

FRAME

Type

C—Channel.
 T—Channel tapered front and rear.
 L—Channel reinforced with liner.
 B—Channel reinforced with both liner and fishplate.
 P—Channel reinforced with plate.
 TL—Channel tapered front and rear reinforced with liner.
 D—Drop Center.
 Tt—Tapered front.
 A—Straight section sidemembers, lined with oak inserts.
 Z—Reinforced (X) member frame, box type sections.

REAR AXLE

Final Drive and Type

B—Bevel.
 CD—Chain Drive
 F—Full-floating.
 H or Hy—Hypoid.
 d—Dual range axle.
 2—Double Reduction.
 S—Spiral bevel.
 W—Worm.
 ¾—Three Quarters Floating.
 ½—Semi-Floating
 T—Torque Tube

GEAR RATIOS

(**) Only one ratio.

Drive and Torque

H—Hotchkiss (springs).
 R—Radius Rods.
 L—Parallel Torque Rods
 T—Torque Arm.

GOVERNOR STANDARD

Y—Yes.
 N—No.

Line Number	MAKE AND MODEL	WHEEL-BASE		Gross Vehicle Weight	Chassis List Price	TIRE SIZES		ENGINE DETAILS					TRANS-MISSION		REAR AXLE		FRONT AXLE		BRAKES				C-A Dimensions (Min. Std. W. B.)	Type			
		Minimum Standard	Maximum Standard			Standard Rear	Maximum Authorized Front and Rear (See definition)	Dual rear S-single rear	No. of Cylinders, Bore and Stroke	Displacement	Comp. Ratio	Torque lb. ft.	H.P. at R.P.M.	Number and Diameter Main Bearings	Governor Standard	Make and Model	Forward Speeds	Make and Model	Gear and Type	Drive & Torque	Gear Ratio	Range in High			Make and Model	Location	Type	Operation	Lining Area	Drum Area	Hand Location
1	Available	200	200	15000	5500	7.00/20D	8.25/20	Wau BM	6-4x4	3306	9.178	78-2500	2-1/2x10	NWG T9	4-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
2	(c.o.e.)	225	225	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
3	(c.o.e.)	250	250	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
4	(c.o.e.)	275	275	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
5	(c.o.e.)	300	300	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
6	(c.o.e.)	325	325	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
7	(c.o.e.)	350	350	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
8	(c.o.e.)	375	375	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
9	(c.o.e.)	400	400	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
10	(c.o.e.)	425	425	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
11	(c.o.e.)	450	450	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
12	(c.o.e.)	475	475	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
13	(c.o.e.)	500	500	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
14	(c.o.e.)	525	525	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
15	(c.o.e.)	550	550	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
16	(c.o.e.)	575	575	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
17	(c.o.e.)	600	600	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
18	(c.o.e.)	625	625	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
19	(c.o.e.)	650	650	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
20	(c.o.e.)	675	675	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
21	(c.o.e.)	700	700	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
22	(c.o.e.)	725	725	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
23	(c.o.e.)	750	750	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
24	(c.o.e.)	775	775	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
25	(c.o.e.)	800	800	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
26	(c.o.e.)	825	825	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
27	(c.o.e.)	850	850	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
28	(c.o.e.)	875	875	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
29	(c.o.e.)	900	900	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
30	(c.o.e.)	925	925	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
31	(c.o.e.)	950	950	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
32	(c.o.e.)	975	975	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
33	(c.o.e.)	1000	1000	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
34	(c.o.e.)	1025	1025	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
35	(c.o.e.)	1050	1050	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
36	(c.o.e.)	1075	1075	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
37	(c.o.e.)	1100	1100	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
38	(c.o.e.)	1125	1125	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
39	(c.o.e.)	1150	1150	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
40	(c.o.e.)	1175	1175	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
41	(c.o.e.)	1200	1200	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
42	(c.o.e.)	1225	1225	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
43	(c.o.e.)	1250	1250	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
44	(c.o.e.)	1275	1275	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
45	(c.o.e.)	1300	1300	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
46	(c.o.e.)	1325	1325	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
47	(c.o.e.)	1350	1350	20000	6400	8.25/20D	9.00/20	Wau B2	6-4x4	3205	9.235	105-3200	2-1/2x10	NFU 5A330	5-Tim	E100DPH	HF	H	6-20	32502H	LAHV	314	534	TX	TX	103x3	T
4																											

(Turn to Page 144, please)

Bendix Products

BUILDERS OF THE BASICS OF

BETTER MOTOR VEHICLES



B-K* Power
Braking System
for Cargo
Trailers

Bendix*
Automatic Clutch
and Gear Shift
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Bendix
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for Buses,
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Passenger Cars

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DEALERS AND TRUCK OPERATORS AGREE...

HYDROVAC IS FIRST CHOICE!

Everything truck operators look for in power braking they find in greater degree and for less cost in the Bendix Hydrovac*. It gives them easier, smoother, quicker stops with less physical effort. A record number of Hydrovac installations—over 2,000,000 at present—bears out this claim. Ask the man who uses Hydrovac about its performance . . . ask the man who services it

about the upkeep . . . make a personal driving test yourself . . . and you'll see why Bendix Hydrovac power braking is first choice!

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†—Total length 10.5 ft. —Includes ash
—Front 7.00/108.
—Includes spare tire, full fuel tank and cooling
system.

†—Front 7.00/108.
—Includes spare tire, full fuel tank and cooling
system.

†—Front 7.00/108.
—Includes spare tire, full fuel tank and cooling
system.

†—Front 7.00/108.
—Includes spare tire, full fuel tank and cooling
system.

†—Front 7.00/108.
—Includes spare tire, full fuel tank and cooling
system.

[illegible]

58	Bue C.	9147-84	1560	194	194	15000	4200/30/20-8	8.25/20-100W	8RT	9-3 x 3 1/2 x 239/6	8150/100-3500-2	2.40x	9 N/Own 4IT	4/Own 8T	5F	H15.14-.67Ow	7RTH	OATH	13029	5000C/20	1104	17.0832-85-9124
59	Bue C.	9147-84	1560	194	194	15000	4200/30/20-8	8.25/20-100W	8RT	9-3 x 3 1/2 x 239/6	8150/100-3500-2	2.40x	9 N/Own 4IT	4/Own 8T	5F	H15.14-.67Ow	7RTH	OATH	13029	5000C/20	1104	17.0832-85-9124
<p>† Front only; Rear 10.00/20. ‡ Front only; Rear 9.25/20. § Cowl to A-20. ¶ For more info, call 1-800-345-1034. * Auxiliary trans. Spline 2231b, three forward speeds. †† Front only; Rear 8.25/10. ‡‡ Front only; Rear 8.25/10. §§ Reinforced 6.58x2.1in. 125, extended to include front spring rear brackets and rear include front bearings.</p>																						

(Turn to Page 146, please)



SEALED POWER MD-50

The only ring with the Full-Flow Spring!

Thousands of owners everywhere praise the oil control, the long life, the easy installation and easy starting of the amazing Sealed Power MD-50 Steel Oil Ring—the only ring with the FULL-FLOW SPRING! Fleets report new oil economy and extra thousands of miles between ring changes. They say this great ring works even in tapered and out-of-round bores. The Sealed Power MD-50 Steel Oil Ring is featured in all Sealed Power "X" Ring Sets—for all popular cars and trucks. Sold by leading distributors everywhere, or write Sealed Power Corporation, Muskegon, Michigan.

**TWICE AS MANY SLOTS FOR
FULL FLOW OF OIL**

Through Ring



Through Spring



Through Oil Holes



GENTLE CURVES



INSTEAD OF HUMPS

for greater tension flexibility in tapered and out-of-round bores plus greater bearing area for longer spring and ring life.

Sealed Power

PISTON RINGS

BEST IN NEW TRUCKS!

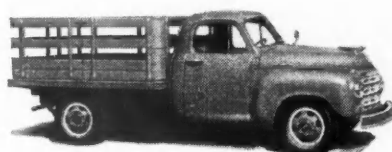
BEST IN OLD TRUCKS!

(Continued from page 144)

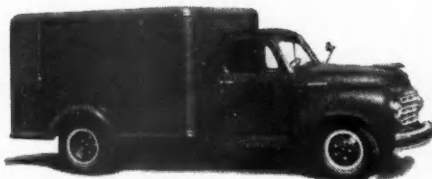
Line Number	MAKE MODEL	WHEEL-BASE		TIRE SIZES		Chassis List Price	ENGINE DETAILS		TRANSMISSION		REAR AXLE		FRONT AXLE		BRAKES			FRAME																					
		Minimum Standard	Maximum Standard	Standard Rear	Dual rear S-Single rear		Model	No. of Cylinders	Stroke	Displacement	Comp. Ratio	Torque lb. ft.	H.P. at R.P.M.	Main Bearings	Governor Standard	Make and Model	Forward Speeds	Make and Model	Clear and Type	Drive & Torque	Clear Ratio	Range in High	Make and Model	Location	Operation	Lining	Drum Area	Drum Material	Hand Location	C-A Dimensions (Min. Std. W. B.)	Side Rail Dimensions	Type							
Ford, Continued																																							
1	Cowl, 9HWH-84	1610	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
2	Cowl, 9HWH-84	1640	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
3	Cowl, 9HWH-84	1670	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
4	Cowl, 9HWH-84	1670	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
5	Cab, 9HWH-81	1990	110	110	110	110	110	110	110	110	110	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
6	Cab, 9HWH-81	2020	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
7	Cab, 9HWH-81	2050	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
8	Cab, 9HWH-81	2050	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
9	Cab, 9HWH-81	2050	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
10	Cab, 9HWH-81	2050	134	134	134	134	134	134	134	134	134	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
11	Cowl, 9HWH-84	2685	135	135	135	135	135	135	135	135	135	8-3	3.4	3376	8.180	145-3000	3-2.874	9	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	444	697	Co	TX	61	61	9.03x8.8x25	T	
12	Cowl, 9HWH-84	2735	135	135	135	135	135	135	135	135	135	8-3	3.4	3376	8.180	145-3000	3-2.874	9	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	444	697	Co	TX	61	61	9.03x8.8x25	T	
13	Cowl, 9HWH-84	2735	135	135	135	135	135	135	135	135	135	8-3	3.4	3376	8.180	145-3000	3-2.874	9	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	444	697	Co	TX	61	61	9.03x8.8x25	T	
14	Cowl, 9HWH-84	3155	135	135	135	135	135	135	135	135	135	8-3	3.4	3376	8.180	145-3000	3-2.874	9	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	444	697	Co	TX	61	61	9.03x8.8x25	T	
15	Cowl, 9HWH-84	3205	135	135	135	135	135	135	135	135	135	8-3	3.4	3376	8.180	145-3000	3-2.874	9	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	444	697	Co	TX	61	61	9.03x8.8x25	T	
16	Cowl, 9HWH-84	3255	135	135	135	135	135	135	135	135	135	8-3	3.4	3376	8.180	145-3000	3-2.874	9	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	444	697	Co	TX	61	61	9.03x8.8x25	T	
17	Intern'l (2)	960	113	125	4000	2250	6.00/16-4	7.00/16	2250	6.00/16-4	7.00/16	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
18	KB-1	978	102	113	4000	2250	6.00/16-4	7.00/16	2250	6.00/16-4	7.00/16	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
19	KB-2	1010	125	125	4000	2250	6.00/16-4	7.00/16	2250	6.00/16-4	7.00/16	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
20	KB-3	1010	125	125	4000	2250	6.00/16-4	7.00/16	2250	6.00/16-4	7.00/16	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
21	KB-4	1010	125	125	4000	2250	6.00/16-4	7.00/16	2250	6.00/16-4	7.00/16	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7	
22	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
23	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
24	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
25	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
26	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
27	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
28	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
29	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
30	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	Ow	41T	4	Ow	8TH	H	H	7-2	Ow	7RTH	O41HV	302	506	Co	TX	60	60	7.083x8.8x17	L7
31	(a)	1120	135	176	15000	46257	6.00/20-10	8.25/20	15000	46257	6.00/20-10	8.25/20	6-3	3.4	2296	8.180	95-3300	4-2.874	8	N	O																		



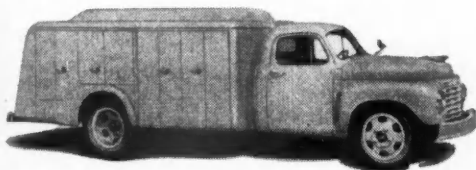
1½-ton shown with 12-foot body—2-ton model also available



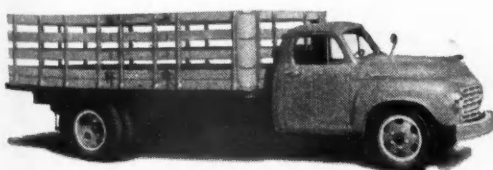
¾-ton shown with 8-foot platform stake—
1-ton model also available



1-ton shown with 9-foot closed van body—
1½-ton model also available



1½-ton shown with bottler's body—
2-ton model also available



2-ton shown with 14-foot platform stake—
1½-ton model also available

You can't help looking twice at a handsome Studebaker truck

**It's America's stand-out new truck
in low-cost performance, too!**

A CALIFORNIA man credits his Studebaker '49er truck with a good 50 per cent saving in maintenance time.

A South Carolina hauler finds he can cover a 740-mile route on considerably less gasoline than his former truck used.

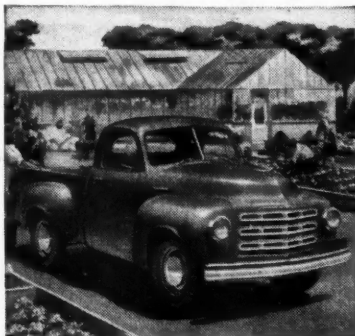
A New York oil refinery's agent says—"People cluster around our new Studebaker

truck everywhere we make a delivery. Everyone thinks it's the best looking truck they've seen."

Yes, a new Studebaker '49er is revolutionary in styling and structure—in time-saving, cost-saving improvements.

It's the world's first truck with engine, ignition and wiring within arm's reach when you lift the hood.

It has an exclusive new kind of roomy, weather-tight, wide-vision cab—a low cab floor that saves strenuous climbing—wide doors with "hold-open" stops—foot-controlled "air-scoop" ventilation—cab steps are weather-protected, enclosed inside the doors.



½-ton, 6½-ft. pick-up—also available
are ¾-ton and 1-ton 8-ft. pick-ups

STUDEBAKER TRUCKS

NOTED FOR LOW COST OPERATION
Studebaker Corp'n, South Bend 27, Ind., U.S.A.

Line Number	MAKE MODEL	WHEEL-BASE		TIRE SIZES		ENGINE DETAILS				TRANSMISSION		REAR AXLE		FRONT AXLE	BRAKES				FRAME						
		Minimum	Maximum	Standard	Front and Rear	Chassis Weight (See definition)	Gross Vehicle Weight (For Normal Service)	Chassis List Price	No. of Cylinders	Displacement	Comp. Ratio	Max. H.P. at R.P.M.	Main Bearings and Diameter	Governor Standard	Make and Model	Forward Speeds	Make and Model	Location	Operation	Area	Drum	Drum Area	Hand Location	C-A Dimensions (Min. Std. W. B.)	Side Rail Dimensions
14	Reo, cont.																								
15	D-258-A	130	130	9.00/20	9.00/20	7150*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
16	D-258-B	130	130	9.00/20	9.00/20	7170*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
17	D-258-C	130	130	9.00/20	9.00/20	7190*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
18	D-258-D	130	130	9.00/20	9.00/20	7210*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
19	D-238-A	130	130	9.00/20	9.00/20	7230*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
20	D-238-B	130	130	9.00/20	9.00/20	7250*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
21	D-238-C	130	130	9.00/20	9.00/20	7270*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
22	D-238-D	130	130	9.00/20	9.00/20	7290*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
23	D-238-E	130	130	9.00/20	9.00/20	7310*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
24	D-238-F	130	130	9.00/20	9.00/20	7330*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
25	D-238-G	130	130	9.00/20	9.00/20	7350*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
26	D-238-H	130	130	9.00/20	9.00/20	7370*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
27	D-238-I	130	130	9.00/20	9.00/20	7390*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
28	D-238-J	130	130	9.00/20	9.00/20	7410*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
29	D-238-K	130	130	9.00/20	9.00/20	7430*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
30	D-238-L	130	130	9.00/20	9.00/20	7450*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
31	D-238-M	130	130	9.00/20	9.00/20	7470*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
32	D-238-N	130	130	9.00/20	9.00/20	7490*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
33	D-238-O	130	130	9.00/20	9.00/20	7510*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
34	D-238-P	130	130	9.00/20	9.00/20	7530*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
35	D-238-Q	130	130	9.00/20	9.00/20	7550*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
36	D-238-R	130	130	9.00/20	9.00/20	7570*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
37	D-238-S	130	130	9.00/20	9.00/20	7590*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
38	D-238-T	130	130	9.00/20	9.00/20	7610*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
39	D-238-U	130	130	9.00/20	9.00/20	7630*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
40	D-238-V	130	130	9.00/20	9.00/20	7650*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
41	D-238-W	130	130	9.00/20	9.00/20	7670*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
42	D-238-X	130	130	9.00/20	9.00/20	7690*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
43	D-238-Y	130	130	9.00/20	9.00/20	7710*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
44	D-238-Z	130	130	9.00/20	9.00/20	7730*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
45	D-238-AA	130	130	9.00/20	9.00/20	7750*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
46	D-238-AB	130	130	9.00/20	9.00/20	7770*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
47	D-238-AC	130	130	9.00/20	9.00/20	7790*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
48	D-238-AD	130	130	9.00/20	9.00/20	7810*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
49	D-238-AE	130	130	9.00/20	9.00/20	7830*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
50	D-238-AF	130	130	9.00/20	9.00/20	7850*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
51	D-238-AG	130	130	9.00/20	9.00/20	7870*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
52	D-238-AH	130	130	9.00/20	9.00/20	7890*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
53	D-238-AI	130	130	9.00/20	9.00/20	7910*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
54	D-238-AJ	130	130	9.00/20	9.00/20	7930*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
55	D-238-AL	130	130	9.00/20	9.00/20	7950*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
56	D-238-AM	130	130	9.00/20	9.00/20	7970*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
57	D-238-AN	130	130	9.00/20	9.00/20	7990*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
58	D-238-AO	130	130	9.00/20	9.00/20	8010*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
59	D-238-AP	130	130	9.00/20	9.00/20	8030*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
60	D-238-AQ	130	130	9.00/20	9.00/20	8050*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
61	D-238-AR	130	130	9.00/20	9.00/20	8070*	23000	11750*	6-4	371.6	6.32/92	111-26000	2-13x13	9	Y Cla 270 VO	5	Tim 58300	HF	TAIVH*	370	644	var	TX	63x35	9x35x13
62	D-238-AS	130	130	9.00/20	9.00/20	8090*	23000	11750*	6-4																

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"Bull's-Eye" electrolyte leveling device • Heavy inter-cell connectors • Hard rubber container • Positive cover seals.

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THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

COMMERCIAL CAR JOURNAL, April, 1949

(Continued from Page 148)

Line Number	MAKE AND MODEL	Chassis List Price	WHEEL-BASE		TIRE SIZES	ENGINE DETAILS				TRANSMISSION		REAR AXLE		FRONT AXLE	BRAKES				FRAME			
			Minimum	Maximum		No. of Cylinders	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at R.P.M.	Number and Length of Main Bearings	Governor Standard	Make and Model	Make and Model	Make and Model	Operation	Area	Drum	Hand Location	C-A Dimensions (Min. Std. W. B.)	Side Rail Dimensions	Type
1	Marmot, con't.																					
2	(C) R-4	122	122	122	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
3	(C) R-4	122	122	122	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
4	(C) R-4	122	122	122	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
5	(C) R-4	122	122	122	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
6	(C) R-4	122	122	122	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
7	Oakleaf	149	149	149	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
8	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
9	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
10	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
11	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
12	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
13	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
14	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
15	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
16	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
17	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
18	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
19	(D) W-703	150	150	150	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
20	Steering	160	160	160	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
21	(D) DD145H	167	167	167	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
22	Water (e.f.)	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
23	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
24	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
25	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
26	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
27	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
28	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
29	(e.f.) F-2M	126	126	126	7.50/17	6	238	10.00/20	180	100-3800	2-1/2 x 4 7/8	N Ford	4 Ford	4 Ford	4 Ford	H	180	580	A	48	10 1/2 x 3 1/2	T
30	Willys Jr., CJ-3A	1220*	80	80	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90C	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
31	(D) 4WD	1725*	118	118	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
32	Dodge	154	154	154	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
33	Duplex	162	162	162	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
34	(D) TH6	160	160	160	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
35	(D) TH6	160	160	160	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
36	Federal	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
37	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
38	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
39	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
40	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
41	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
42	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
43	(D) 663MA	189	189	189	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
44	F.W.D., M6x6	135	135	135	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
45	(D) M6x6	135	135	135	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
46	International (2)	151	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
47	(D) 4WD	3300	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
48	(D) 4WD	4950	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
49	(D) 4WD	7425	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
50	(D) 4WD	12925	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
51	(D) 4WD	13225	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
52	(D) 4WD	15700	151	151	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
53	Kenworth	187	187	187	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
54	(D) 522	187	187	187	7.00/15	4	134	10.00/16	105	60-4000	3-23/32 x 4 1/2	NWG T90A	6 Tm SBD1055	6 Tm SBD1055	6 Tm SBD1055	H	118	198A	F	42	10 1/2 x 3 1/2	P
55	(D) 5																					

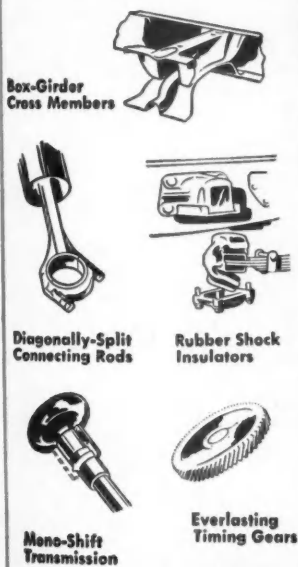
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(Turn to Page 152, please)

1949

(Continued from Page 150)

Line Number	MAKE AND MODEL	Chassis Last Price	WHEEL-BASE		Gross Vehicle Weight for Normal Service	Chassis Weight (See definition)	TIRE SIZES		ENGINE DETAILS										TRANS. MISSION	REAR AXLE		FRONT AXLE	BRAKES			FRAME																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
			Minimum Standard	Maximum Standard			Standard Rear	Dual rear S-single rear	No. of Cylinders	Stroke and Bore	Displacement	Torque lb. ft.	H.P. at R.P.M.	Main Bearings	Governor Standard	Make and Model	Clear and Type	Drive & Torque		Gear Ratio	Range in High		Model and Make	Location	Operation		Lining	Drum	Drum	Hand Location	Type																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

- Composite Cast Alloy Iron.

Cast Alloy Iron.

• 6231 Spicer Auxiliary Transmission.
• Single front, dual rear.

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Two speed style available—6 13-8 10.

Including slip-over reinforcing frame channels.

□ Chassis weights on dual axle front necessary to furnish 52 inch axle spacing.

laumis power divider.

y transmission.

A Systematized Fleet Safety Program

BY THE BUREAU OF HIGHWAY SAFETY . . . NATIONAL COUNCIL

OF PRIVATE MOTOR TRUCK OWNERS, INC., WASHINGTON, D. C.

The

Why and How



of Group Safety Meetings and the Development of Safety Committees

The

Why

SAFETY TEXT No. 7

MANAGEMENT must assume leadership in the safety effort.

It must create or instill a "safety consciousness" in all employees and develop a personal interest in accident prevention. Any well planned safety program should include properly organized safety meetings.

These meetings fall into three general classifications. Namely, (1) Group Safety Meetings, (2) Supervisors Safety Conferences, (3) Safety Committee Meetings.

Group Safety Meetings

Well planned Group Safety Meetings invariably pave the way for "safety" thinking and prove effective for generating enthusiasm and promoting the discussion of accident prevention.

The enthusiasm aroused in safety by such meetings, coupled with the fact that executives, supervisors and employees alike jointly participate and interest themselves, always affects the thinking of the more skeptical employees and does much to aid the development of organization spirit and cooperative effort.

Meetings of this kind also have been found profitable in many other ways by those who have successfully conducted intensive safety educational activities among their employees engaged in motor vehicle operation. Group meetings, however, should never be used as a substitute for individual training and instruction of drivers—they should always supplement such programs.

Group Safety Meetings are most helpful in the announcement of an accident prevention contest; to emphasize some serious accident trend; for the presentation of company safety awards; for periodic stimulation of general safety interest, etc.

Supervisors Safety Conferences

Management will find it helpful if they will sit down with their supervisors or foremen at frequent intervals to talk safety with

them and review policy, accident trends and other matters pertaining to safe vehicle operation.

In small plants this may be done by the manager in an informal meeting with two or three of his key men. In larger operations, it is preferable to get supervisors and foremen together in a group, either weekly or monthly, depending on the circumstances. An opportunity should always be given for those present to freely express themselves.

Safety Committee Meetings

Meetings between the supervisor or other representative of management and the drivers under his control through a "safety committee" set-up provide a primary and intimate means of contact by which management may develop and maintain the interest of the employee in its highway safety program. But again the effectiveness of any safety committee is dependent upon the type of leadership provided by management and the close cooperation it can inspire in both supervisor and driver.

In addition to assisting the supervisor or foreman in the safety activities of his department, a Safety Committee provides the proper channel through which:

1. Employees can give expression to their safety ideas.
2. Specific hazards of the job can be studied.
3. Accident causes can be analyzed and corrective measures recommended.
4. Checks can be made to ascertain if new drivers are properly instructed.
5. Responsibility can be fixed for vehicle accidents.
6. Safety rules can be formulated.
7. Safety activities can be generally stimulated.

Combined Effort Essential

Safety is not a one-man job but that of the whole organization. When accidents occur both the employer and employee lose, and in most personal injury cases, the employee stands to lose more than the employer—even, perhaps, his life.

It must be remembered that management can hold safety meetings, set up committees, prescribe rules and regulations—BUT such activity will prove meaningless and ineffective unless the interest of their employees can be aroused and maintained.

No. 7 SAFETY Meetings and Committees

Group Safety Meetings

The effectiveness of a Group Safety Meeting depends upon the thoroughness of its preparation. It must be full of action; interest-provoking items must be injected; it must be as brief and concise as the subject matter will allow—starting and ending upon a predetermined time schedule.

Programs for meetings held at regular intervals should be varied to sustain interest. Rather than to confine the program to safety, it is sometimes desirable to include related subjects.

A sample agenda for a Group Safety Meeting should include:

1. Reason for calling the meeting.
2. Review of recent accidents, their causes and prevention.
3. Discussion of economic effect of accidents—
 - (a) on the driver,
 - (b) on the interruption of business,
 - (c) on loss of public good will.

This above may be simplified by the effective use of such vital aids as charts, graphs, sound-slide films and motion pictures. In simple words, a general outline for the agenda should be—(1) What to do; (2) When to do it; and (3) How to do it. Items on the first point can either be management inspired or obtained from an employee—"a suggestion box" might be a good source for such material. The second and third points are usually worked out and solved through discussion at the meeting. Experience has proved that as such meetings progress there are various suggestions made by the drivers themselves and good material seldom is lacking. Encourage individual participation.

Attendance at all such meetings will be insured by holding them on company time. Notice of meetings should reach all employees well in advance. Additional publicity may be given to the meeting by bulletin board posting.

The meeting should be held in well-ventilated and comfortable surroundings where everyone is able to hear and see clearly.

The chairman or discussion leader must know his subject and present it in simple language and in such a manner as to hold his audience's attention. He should display a sense of humor if the occasion permits, phrase his remarks upon a "we" rather than a "you" basis, and never underestimate the intelligence of his audience.

A brief review or summary of the main points covered should be made at the close of the meeting. If safety literature is distributed it should be given out at this time.

Supervisors Safety Conferences

If the group is composed of only one or two supervisors or foremen, it should be held in the manager's office. If the group is larger, it should be held in a place where the manager can conduct a meeting free from interference or other interruptions.

The manager in every case should be in charge of a meeting of this kind. He should talk directly to his key men about the vehicle accident experience of the operation, present any problems, and be prepared to receive or give answers. He should issue orders changing any unsatisfactory procedure, discuss accident costs when necessary and comment favorably on good safety or performance records. Meetings should be on company time; be short and to the point—30 minutes is recommended.

Development of Safety Committees

MEMBERSHIP: There are no hard and fast rules for setting up a Safety Committee, and the personnel will vary according to the size and type of organization. Each fleet operator must select the type of committee best suited to his needs.

For large operations, each operating and maintenance department should be represented along with drivers.

In small organizations, several drivers could make up the

committee, with management being represented by the supervisor or foreman serving as chairman.

Employees will react more favorably to safety activities if given definite responsibilities, such as service on a safety committee. Therefore, it is well to have as many drivers as possible serve, preferably rotating them after six months or a year of service.

FREQUENCY OF MEETINGS: The Safety Committee should meet regularly, on company time, at least once a month on a predetermined date. Special meetings may be called at any time at management's discretion. The chairman should be charged with full responsibility to see that meetings are held on schedule and members given sufficient advance notice.

MEETING PLACE AND SEATING ARRANGEMENTS: Meeting place and seating arrangements should be given careful consideration for it is of extreme importance that both of these be right. The room in which meetings are to be held should be of sufficient size, well lighted, ventilated, clean.

The chairs should be comfortable and sufficient in number so that no one will have to stand up. Chairs should be arranged so that those present can see not only the chairman, but each other.

CONDUCT OF MEETINGS: To be successful, committee meetings must be carefully organized by the chairman and conducted in a thorough and business-like manner.

Complete minutes should be kept by a secretary, with all recommendations being noted and followed up until completed or otherwise disposed of. Such minutes should include:

- (a) the date, time and place of meeting;
- (b) names of members present (and absent);
- (c) reading of the minutes of the previous meeting;
- (d) safety recommendations completed since last meeting;
- (e) status of old recommendations;
- (f) new recommendations and proposed action;
- (g) reports of subcommittees;
- (h) review and classification of accidents since last meeting;
- (i) recommendations as to any safety awards.

The committee should also give prompt and impartial consideration to any suggestions made by a driver or a supervisor. Such formal procedure saves time, increases the effectiveness of the meeting and insures action on recommendations.

RELATIONSHIP WITH MANAGEMENT: The committee should act in an advisory capacity to management. It should keep management advised as to the status of all approved safety recommendations. Its members should be made to feel that they are assisting management in the reduction of accidents, the prevention of injury to employees, and the conservation of equipment.

MANAGEMENT MUST MAINTAIN INTEREST: We repeat, management can hold meetings, set up committees, prescribe rules and regulations, but it will prove of little avail unless the interest of employees can be aroused and constantly maintained.

Posting of notices, issuing of awards are not sufficient to maintain interest. To get results management must personalize its safety program by actively participating in all of its activities. Management must also be specific in making recommendations so that there are no misunderstandings as to what is to be done, how it is to be done and when it is to be done. Lastly, management should personally follow up to see that its personnel is daily carrying out approved procedures and practices.

SAFETY INSTRUCTIONS

In This Highway Safety Program

PRECEDING ISSUES:

Management Responsibility, Driver Responsibility
Driver Selection, Training and Supervision
Accident Reports and Records, Human Engineering
Visual Information . . . Contests . . . Awards

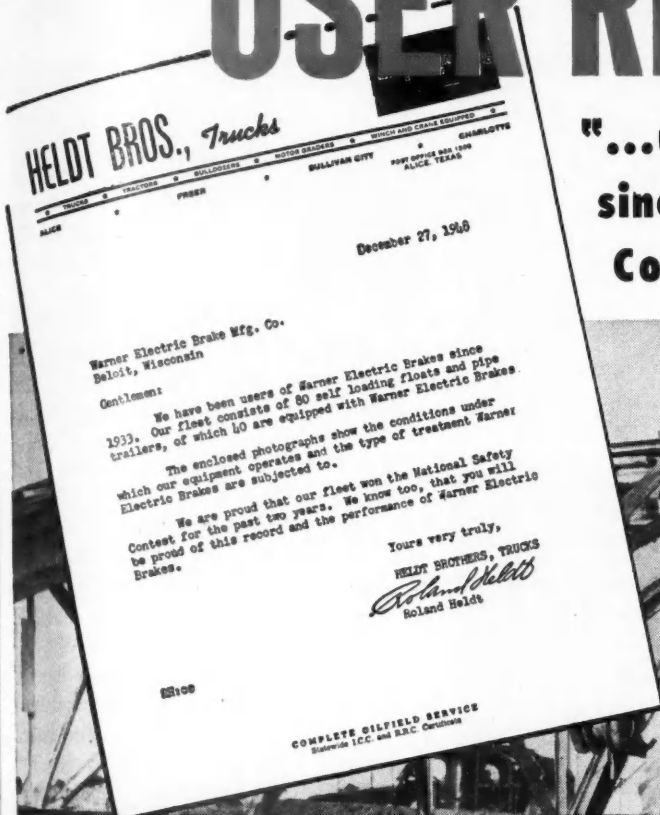
SUCCEEDING ISSUES:

First-Aid Training, Conservation of Equipment
Unusual Highway Hazards; Winter Driving; Holiday
Hazards; Night Driving; Grade Crossings
Fire Prevention
Safety Through Courtesy . . . Defensive Driving

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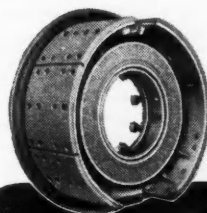


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Introduces Two New Heavy - Duty Diesels

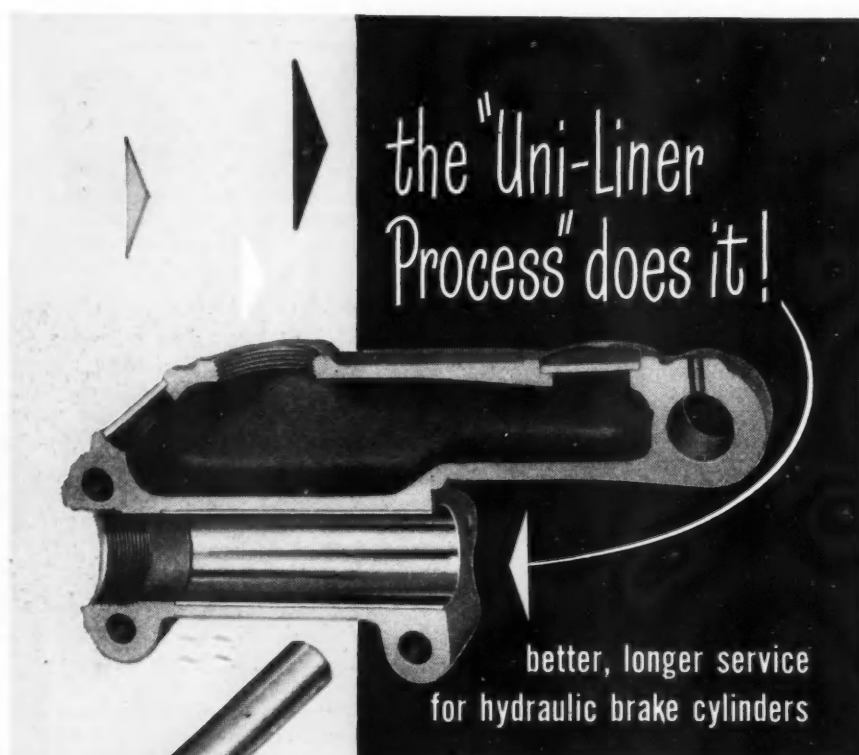
INTERNATIONAL HARVESTER has announced two new diesel-powered trucks, Models KBD-12 and KBRD-14 with GVW ratings of 31,500 lb and 35,000 lb, respectively. They are designed to meet the rigid requirements of heavy-duty operators requiring more power, improved performance, and maximum fuel economy. The

KBD-12 fills the needs of over-the-road operators. It is suited to tractor-trailer work, or with the long 215-in. wheelbase and a long freight body, it is well adapted to city operation. The KBRD-14 is a heavy-duty truck for rugged off-highway service.

The power plant of these new models is the new HRB-600 Cummins diesel which develops 165-hp at 1800 rpm. The new engine has 5 1/8-in. bore, 6-in. stroke, and a displacement of 743 cu. in. Other engine features include new sleeves, pistons and head gaskets, increased-flow lubricating system and continuous groove bearings. A new and larger air cleaner is mounted on the outside at the right side of the cowl. A newly designed muffler, 5 ft long and 6 in. in diameter, is mounted upright outside the cab right rear corner. A 4-in. diameter exhaust stack is used. The clutch is a 15-in. single-plate dry disc type.

The KBD-12 is available with single or double reduction drive or two-speed rear axles, each available in three axle ratios. The KBRD-14 offers an option of either double-reduction final drive (five ratios) or two-speed rear axle with 6.41 and 8.38 ratios. Standard tires are 11:00-20 with 11:00-22, 11:00-24, 12:00-20 and 12:00-24 as optional.

Transmissions of both models are of the five-forward-speed type with either direct in fifth or overdrive fifth. Except in the 155-inch wheelbase chassis, two optional auxiliary transmissions are available to meet operating requirements. These auxiliary gear boxes, each with overdrive and underdrive ratios, in combination with the available five-speed transmissions and various rear axle ratios, permit the selection of exactly the right combination of power and speed to meet the requirements of any and all operations for which these models are suitable.



"Uni-Liner Process" BRINGS THREE VITAL IMPROVEMENTS!

- Insures against leakage and shifting
- Resists corrosion and pitting
- Reduces wear on moving parts

The cutaway above reveals one of the greatest improvements ever made in hydraulic brake cylinders—the new and exclusive "Uni-Liner Process." Developed and patented by United Parts, the "Uni-Liner Process" lengthens cylinder life and improves cylinder performance in three vital ways. The steel "Uni-Liner," being denser than porous iron, resists damaging corrosion and pitting. Its highly polished surface reduces wear on all moving parts. And its press fit and gravity seal insure against leaking and shifting. Ask your NAPA Jobber for United cylinders made by the "Uni-Liner Process." United Parts Mfg. Co., 1250 W. Van Buren St., Chicago 7.

UNITED

HYDRAULIC BRAKE PARTS • BRAKE CABLES
SPEEDOMETER CABLES • FUEL PUMP PARTS

First in heavy-duty truck sales for 17 straight years!



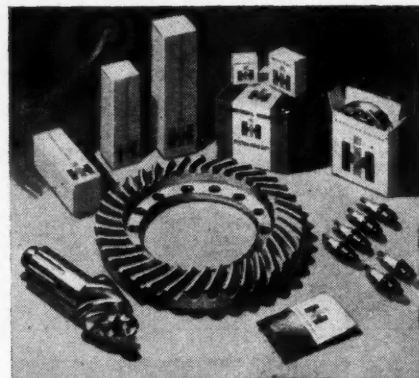
1. Rated first in value by America's most exacting truck buyers!

For 17 straight years, registration figures for new trucks with gross weight ratings over 16,000 lbs. have shown International Trucks in first place. Would America's most exacting truck buyers have given Internationals that vote of confidence unless they knew Internationals were the best value in the heavy-duty truck field?



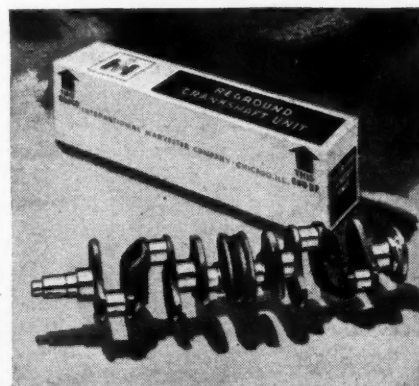
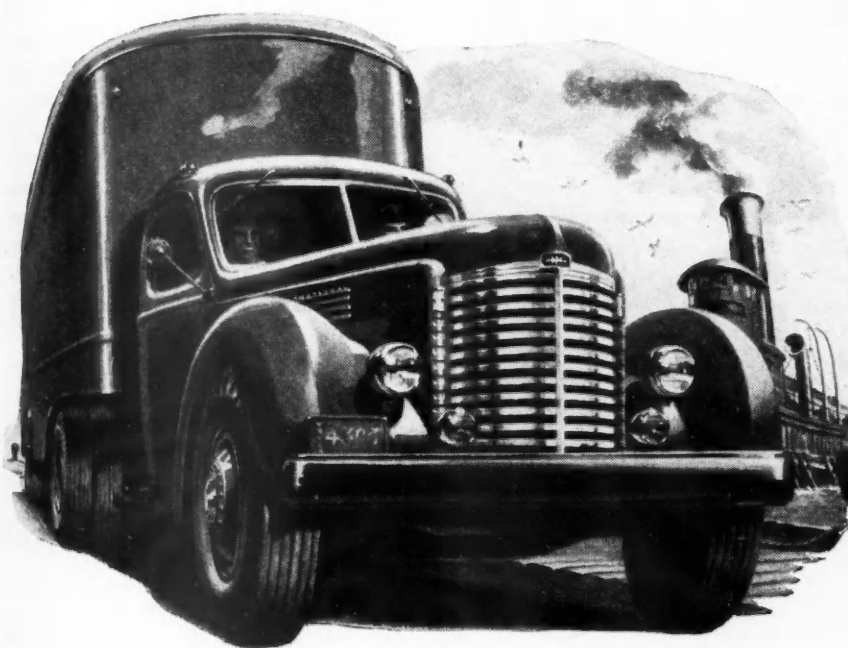
2. Backed up by the nation's largest exclusive truck service organization!

4,700 International Truck Dealers and 170 Company-owned Branches and Service Stations stand ready to keep International heavy-duty trucks operating at peak efficiency. Factory-trained mechanics and special tools are on hand to give International Trucks the diagnosis, service, testing and repairs to correct any trouble.



3. Precision-engineered parts help keep the leader leading!

Replacement parts have a place on the all 'round truck team that keeps Internationals ahead of the field. They're precision-engineered parts, just like the originals. They're made to fit and do a better job and last longer. Ample inventories of parts and approved accessories are available at all Dealers and Branches.



4. Inexpensive factory-rebuilt exchange units are important, too!

Owners of heavy-duty International Trucks also save money on crankshafts, clutches, carburetors, transmissions, differentials, brake shoes and electrical equipment. Complete International units, reconditioned and factory-rebuilt, are priced way below new ones and covered by new unit International warranty.

5. You don't stay first in sales for 17 straight years unless you're first in value!

No matter what model International Truck you buy—heavy, light or medium-duty—you get the same basic values that have made International Trucks first in the heavy-duty truck field for 17 straight years.

You get a rugged truck that hasn't been weakened by a single compromise with passenger car engineering.

You get a truck specialized to meet your particular requirements by truck engineers. You have 22 basic International Truck models and 1,000 truck combinations to choose from.

For real truck value, see your nearest International Truck Dealer or Branch before you buy any truck.

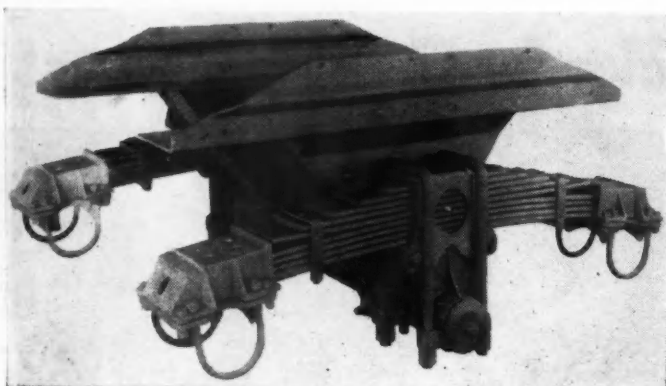


International Harvester Builds
McCormick Farm Equipment . . . Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

Tune in James Melton and "Harvest of Stars"
NBC, Sunday afternoons

INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO



NEWAY TANDEM Trailer Suspension Unit

A TANDEM SPRING SUSPENSION system of unique design for heavy-duty trailers is offered to fleet operators by the Neway Equipment Co., Muskegon, Mich. It is intended for installation in new trailers when specified by the user, for converting single axle jobs to tandems.

Neway equipment is available either with single-stage or two-stage springs, the two-stage unit being recommended for general highway use and particularly for tank trailers and semi-trailers where easy riding empty is desirable. Single-stage spring equipment is recommended mainly for off-highway operations. Standard models range in capacity from 34,000 lb to 42,000 lb but special models can be produced for up to 100,000 lb.

General features of design are shown on the accompanying illustration. It is of simple construction, requiring no lubrication, and free from friction elements. Heart of the tandem is the rubber-bushed trunnion which is held securely between a knurled shaft and a grooved steel casting, clamped under tension. The rubber bushing permits controlled movement and this is said to reduce tire scuffing and minimize the transmission of stresses to the frame and body structure.

The two-stage spring design, recommended for most highway operations, guarantees an easy ride. Here the lower stage spring leaves are proportioned to carry empty or partially loaded trailers adequately. However, when the load exceeds the capacity of the lower stage or because of bad road conditions or heavy payload, the upper stage takes hold under deflection and assists in load carrying.

The Spring ends are held securely in rubber at the axle mounting at both ends to maintain alignment. Road shock is always taken by the flexing end of the spring and dissipated through the spring stack.

Attention is drawn to the extremely low trunnion shaft mounting in the interest of preventing tip-over action. The trunnion shaft is accurately cradled midway between the axles with brake levers and brake chambers of the same size on both axles.

Vari-Speed **HANDY GOVERNOR** Characteristics and Advantages

- ① Wide range of governed speeds without the necessity of any change in governor assembly.
- ② Controlled light load speeds.
- ③ Sharp governor cut-off—minimum horsepower loss.
- ④ Low speed droop.
- ⑤ Final full load and no load factory calibration on air flow machine assures you accuracy and uniformity in production.
- ⑥ Simple to adjust.
- ⑦ Simple mechanical design—only one moving shaft.
- ⑧ Sturdy corrosion-free construction.
- ⑨ Stainless steel needle bearings that insure instant response.



**NO OTHER
VELOCITY GOVERNOR
CAN GIVE YOU ALL
THESE ADVANTAGES**

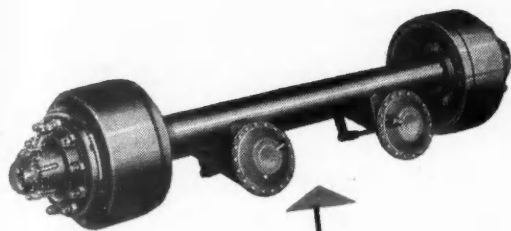


**KING-SEELEY
CORPORATION**

ANN ARBOR

MICHIGAN

PLANTS IN
ANN ARBOR
GRAND RAPIDS
YPSILANTI



"WELD-BUILT" TRAILER AXLES

Every part of the Timken-Detroit Tubular Trailer Axle is electrically welded into a complete one-piece unit for maximum strength and safety. No loose spring seats—no separate brake flanges—no bolted-on parts.

HYPOID GEARING

Offset from the center line of the gear, the Hypoid pinion is bigger and stronger. Bearings are bigger. More teeth are in contact, reducing loading per unit of contact area. Torque-transmitting capacity is increased.

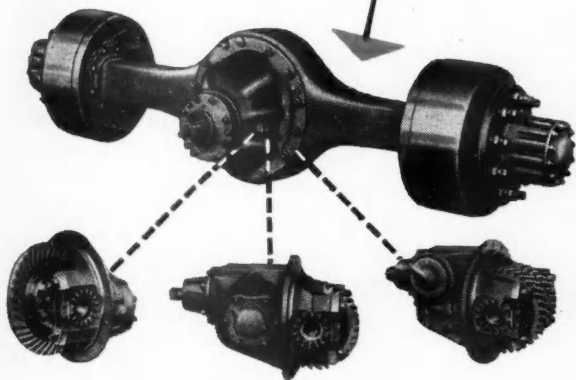
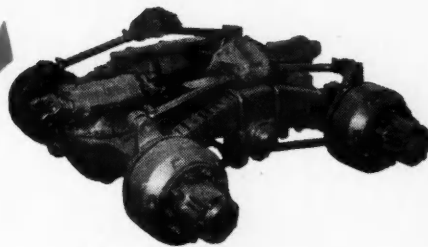


TIMKEN-DETROIT AXLES

Famous for Features
like these

TANDEM-DRIVE UNITS

These rugged units incorporate the famous Timken-Detroit "Cradle-Ride." Long, resilient leaf springs perform load-carrying functions only. Parallelogram torque rod system transmits driving and braking torque to frame, greatly reducing shock.



NEW "3 for 1" AXLES

Timken-Detroit and only Timken-Detroit offers Hypoid Gearing in all three types of final drives—single-reduction, double-reduction, and two-speed double-reduction—each interchangeable in the same axle housing using the same axle shafts.

YOUR ASSURANCE OF SATISFACTION

For nearly half a century, The Timken-Detroit Axle Company has been the acknowledged leader in the design and production of axles and brakes for commercial vehicles. Every Timken-Detroit-equipped truck reflects this matchless experience and engineering skill. Here are products of unsurpassed quality—backed by a name that merits your fullest confidence.

Maybe you think all axles are alike. ☆ If you operate trucks and trailers, it will pay you to learn today's differences between ordinary axles and modern axles. ☆ Many Timken-Detroit Famous Features are illustrated on this page. In all, there are a score or more, making trucks and trailers perform better, last longer and require less maintenance. Most famous of all is Timken-Detroit "Hy-Performance" Hypoid Gearing, used by more and more truck buyers to measure the merit of the entire truck. Write today for new, illustrated literature—learn about *modern* axle and brake design!

TIMKEN *Detroit* AXLES

A PRODUCT OF THE TIMKEN-DETROIT AXLE COMPANY

DETROIT 32, MICHIGAN





Driver George Clark with his International KB-8

HEROIC DRIVER

**Rescues Many Lives
In Western Blizzard**

WITH thanks to International Harvesters' alert public relations department, here is the story of the unselfish and humanitarian role played by a moving van driver during the recent blizzards in the west.

Enroute east from the west coast after loadings at Riverside, Cal., and Phoenix, Ariz., Driver George Clark of the Flushing Storage Warehouse Co., Flushing, Long Island, N. Y., found the highway impassable a few miles beyond the Roadforks Port of Entry at the junction of routes 80 and 86 in New Mexico. An increasing number of trucks, and automobiles with attached house-trailers, were stalled in the heavy snow.

Clark returned to the Roadforks Port, assisting several house-trailer units enroute which had become stalled in the interim period. Clark originally planned to wait at the Port until the snowstorm passed, but immediately altered his plans when reports were received that several women and children were stalled and in danger of freezing in their cars on the road toward Lordsburg.

This emergency prompted Clark to disconnect his trailer and with the aid of another truck driver who volunteered to help, they proceeded to clear the road.

(TURN TO PAGE 162, PLEASE)

Put Your Money on the

Thermoid Line

**Built for
Heavy
Duty
Service**



Thermoid Brake Blocks are made to give you reliable performance under ALL operating conditions, hot or cold, wet or dry—they are not a compromising adaptation. They last longer and reduce "downtime" maintenance costs.

For heavy duty applications requiring up to 1/2-inch thick braking materials, Thermoid CBB Sets are dual-friction, specially molded.

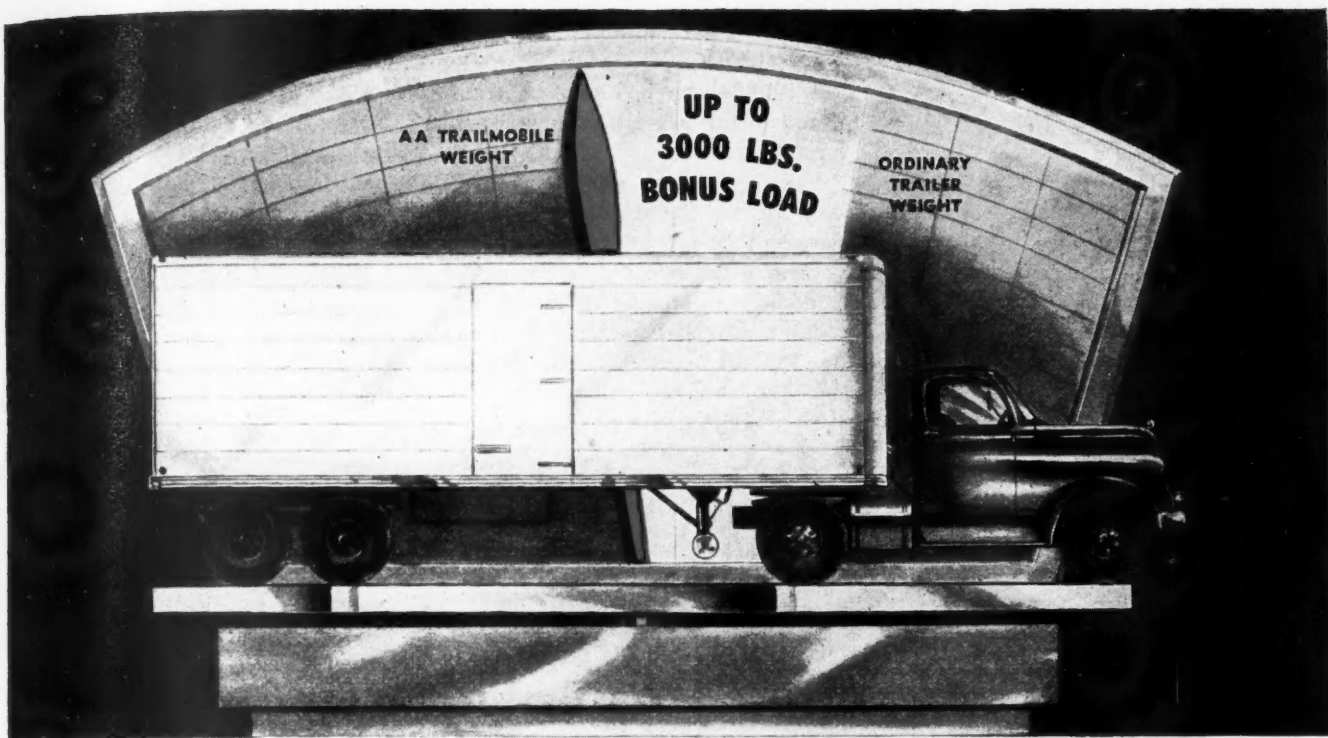
The Thermoid Line

Brake Linings • Clutch Facings • Fan Belts
Radiator Hose • Hydraulic Brake Parts and Fluid
Car Mats • Thermoid Precision Process Equipment
Complete Brake Service Departments

Thermoid Company, Trenton, New Jersey



"Okay so far but don't lemme catch you tryin' to add a porch to it."



Take the weight handicap off your hauling

Pull less equipment and more payload—let the weight go into the freight and make a bonus profit every trip with the new All Aluminum—"All American"—Trailmobile. It is lighter than any trailer ever made before—a combination of lighter material, special shapes and new, distinctive Trailmobile assembly methods. But it is strong—built for the top payloads it is intended to carry. Load tested in the field over some of the toughest hauling operations in the country, it has proved the strength of this new material and design—and proved it is the highest net profit maker for operators on the highway. Where total allowable loads limit your profits, you can take the handicap off your hauling with the New A A Trailmobile.

*Actual scale weight
tickets prove that
you can carry up
to 3,000 pounds
more payload with
the A A Trailmobile.*

**Call the nearest Trailmobile Office for Details
of this "Bonus Profit" trailer.**



TRAILMOBILE

THE TRAILMOBILE COMPANY

Cincinnati 9, Ohio

Berkeley 2, California

Heroic Driver

Continued from Page 160

teered to accompany him, proceeded with the International KB-8 to bring the stranded people back to the Port.

However, before reaching his destination, Clark noticed a small empty panel truck that was abandoned in a drift. After retrieving this truck and making several trips up the road as

far as existing conditions would permit, Clark rescued three women and six small children whom he transferred to the panel truck and towed back to the Port.

Several such trips were made necessary because the standard truck cab can accommodate but two passengers.

Later a full-size bed was removed from the van and set up in the virtually unheated Roadforks Port station and by the use of van pads instead of blankets the children even-

tually were made comfortable after their harrowing experience.

The small Roadforks Port station posed another problem when it became overcrowded with the increasing number of motorists who abandoned their cars and proceeded afoot to the refuge.

Clark again exercised his ingenuity. Opening the side door of the van he made sufficient space available to accommodate about 12 women. Provided with additional van pads they were able to spend the night and next day in reasonable comfort.

This precaution by Clark brought an expression of considerable relief from his weather-imposed "inmates" when it was learned the following day that several children had died from exposure in other cars stalled further along the road toward Lordsburg, which was inaccessible from Roadforks Port.

Hearing of Clark's heroic efforts at Roadforks Port, Earl Stull, director of the Department of Courtesy and Information of the State of New Mexico, later wrote the driver:

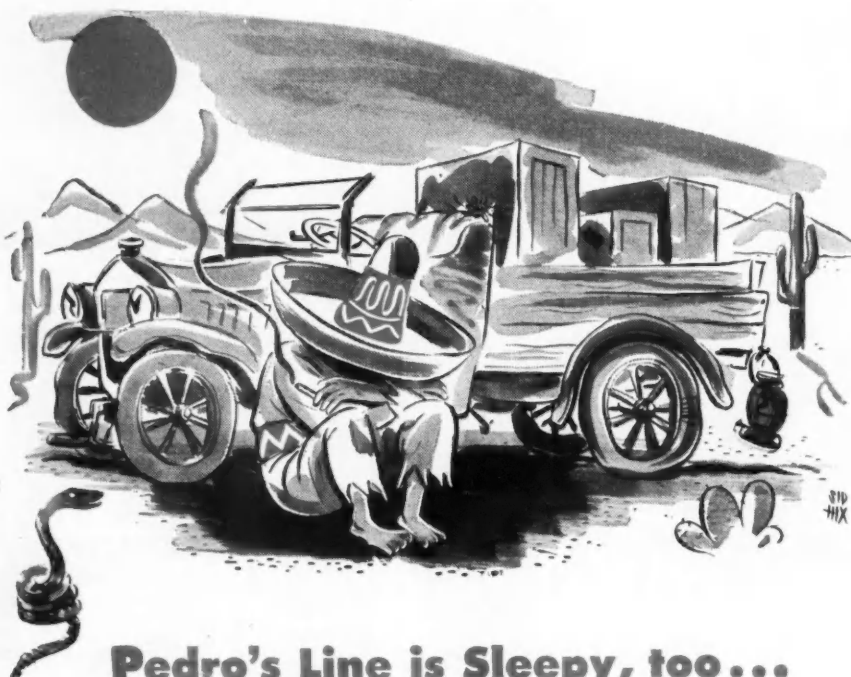
"We wish to express our sincere gratitude for the splendid way in which you cooperated with our men. We have always known the excellent standard of courtesy and helpfulness shown by the truckers on our highways and certainly this recent emergency is no exception."

After the snowstorm stopped, Clark, who did a yeoman's job for 12 hours alone in his truck in addition to being without food for more than two days, was instrumental in removing a road block, giving access to the old road paralleling Route No. 80 into Lordsburg. This maneuver enabled all trucks and cars in the vicinity of Roadforks Port to reach Lordsburg many hours before the road was cleared for traffic.

Noisy Ticker

The Freight Claim Agent called in person to make application for a six-room unit in one of the swank apartment houses. The landlord eyed his prospective tenant coldly. "I must remind you," he said, "that I will not tolerate children, dogs, canaries or cats. And no horn tooting. No radio or television. Is that clear?"

"Yes, sir," said the Freight Claim Agent, taken aback. "But I think I should tell you that we have an old-fashioned clock that ticks audibly."



Pedro's Line is Sleepy, too...

Pedro has a line all right, but it's not getting him to first base. It's as out of date as his Model T—and much less likely to intrigue the modern fleet owner. That's why his "siestas" consume more of his time than knocking on your door.

You can bet your life he's not tied up with the Norlipp line of truck and bus accessories... with its up-to-date styling, wide-awake design and quality construction. Norlipp takes special pride in its "in demand" line of accessories with many brand new improvements for 1949.

When you need equipment for your fleet that will give maximum service at maximum economy, see your Norlipp distributor... the wide-awake salesman with the alert line of fine accessories. You'll appreciate the outstanding quality that has been built into Norlipp by the original founders since the firm was established.



THE NORLIPP COMPANY

5925 So. LOWE AVENUE
CHICAGO 21, ILL.

★ Look to Norlipp for a complete line of "improved for '49" MIRRORS, REFLECTORS, CLEARANCE LIGHTS, SAFETY LIGHTS, BACK-UP LIGHTS, GAS TANK CAPS, RADIATOR CAPS AND RADIATOR ORNAMENTS.

SEE YOUR NORLIPP DISTRIBUTOR OR WRITE US



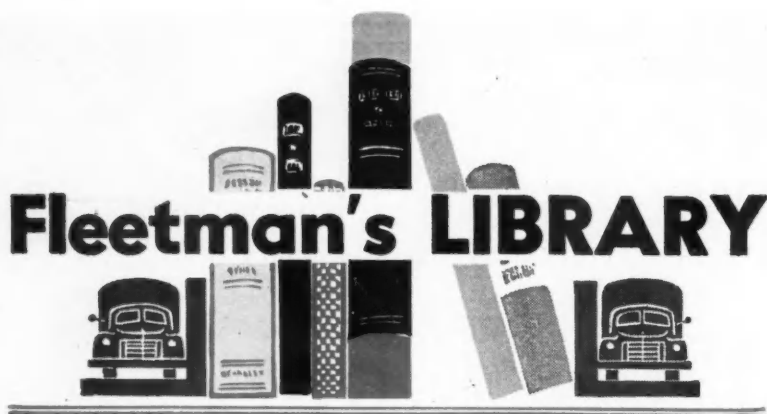
Someone's looking at your truck... Is it making a good impression?

People are quick to judge by appearances. Shabby, neglected-looking trucks can hurt your company's good name. But when your trucks look attractive, they enhance your company's prestige. Your name makes a better, more lasting impression on the public.

Make sure your trucks are promoting your good name. Keep them looking their best with Du Pont DULUX Enamel. Tough, handsome DULUX has long been first choice with the majority of truck and bus fleet operators. Easy to work with, its rugged durability on the road means fewer visits to the paint shop. DULUX resists the hazards of traffic gases, greases, oils, bad weather and rough handling. From start to finish... use Du Pont Finishes. E. I. du Pont de Nemours & Co. (Inc.), Refinish Sales, Wilmington 98, Del.

FOR A COMPLETE JOB—Du Pont Preparakote, the primer that *fills*, is specially formulated to work with DULUX. It goes on easily, dries fast, and stays put! From start to *finish*... use Du Pont finishes.





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The "VERTEX"

*A "Precision" Ignition System
In A Single Unit*

Designed expressly to eliminate the usual difficulties encountered with battery powered ignition systems the Vertex sets new standards for reliability and performance when fitted to the high speed, high compression engines of today's vehicles.

The Vertex is a packaged unit, tailored exactly to fit the distributor drive mountings of any specified engine.

Types of Engines Sparked by Vertex

Automotive	Truck	Industrial
Marine	Tractor	Racing

Full information on request

F. T. GRISWOLD MFG. COMPANY

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**M
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AUTOMOTIVE FUNDAMENTALS, the first of a series of 10 books on automotive training, published by American Technical Society and designed to aid students, mechanics and others in the principles of how and why trucks and tractors work. For further information write American Technical Society, Chicago, Ill.

HUMAN FACTORS IN SAFETY, a new series of six sound slide films, just released by the National Safety Council. The 35 mm, 35 1/3 rpm films comprise a visual training course for the foreman dealing with production and job attitudes, as well as safety. Each film deals with one aspect of the art of handling people. Series shows supervisors how to train new workers, how to keep experienced workers alert, how to win the respect, cooperation and support of their men.

AIR BRAKES, OPERATION AND MAINTENANCE TRAILERS, PART 2, a new visual 16 mm sound film is the third offered by Bendix-Westinghouse on air brake service. This one includes detailed explanation of the company's new relay emergency valve and employs extensive animation and schematic diagrams to show operation. Film is available on a free booking basis or it can be purchased from the factory at Elyria, Ohio.

REPLACEMENT SPRING WALL CHART, a new spring replacement guide covering the popular replacement units for cars and light trucks. Printed in three colors on rigid cardboard, the chart has a heavy metal eyelet for easy wall hanging. Write Tuthill Spring Co., 760 W. Polk St., Chicago, Ill.

TAP DRILL SIZES, a 13 x 19-in. wall chart covering American National Screw Thread Pitches. Sizes of threads, threads per inch, outside diameter of screw, tap drill sizes and decimal equivalent of drill are provided. Price 10 cents. Write South Bend Lathe Works, South Bend 22, Ind.

PLANNING AUTOMOBILE DEALER PROPERTIES, a 150-page book prepared to aid General Motors dealers in utilizing land and buildings. One section includes colored rendered renditions of 16 types of dealerships. Included are examples of property treatment when the business is exclusively in trucks, when a gasoline station is part of the business, when the emphasis is on service rather than sales, etc. Write Department of Public Relations, General Motors Corp., Detroit.

REQUIRED EQUIPMENT FOR LUBRICATION CONTROL, illustrating and describing the portable oil inspection kit. Methods are explained for measuring asphaltic and other deposits, dirt, water, acidity and showing whether corrosion is possible. Write the Gerin Corp., Red Bank, N. J.

LINCOLN WELDING DIRECTORY FOR HARD SURFACING, a 16-page booklet offering detailed explanations for arc weld surfacing and recommendations for the proper material and equipment for the job. Write Lincoln Electric Co., Cleveland 1, Ohio.

(TURN TO PAGE 166, PLEASE)

Snap-on's Famous Ferret Set



Rugged tools . . . twice as strong as you would expect such slim, streamlined handles and thin-walled sockets to be.

"The Choice of Better Mechanics"



Present Owners:
Supplement your basic set with these Special Ferret tools . . .

CLUTCH-TYPE SCREW DRIVER



Handles clutch-type (figure 8) head screws. Built short for easy operation in close quarters.

RATCHET ADAPTOR



Converts any combination of Ferret handle, extension and socket into a reverse action ratcheting tool.



PLASTIC GRIP HANDLE

A shockproof, plastic handle, 5 1/8" long that is ideal for electric work. Makes your Ferret Set more useful.



DOUBLE HEX FLEXOCKETS

Saves a lot of tough work fumbling for hard to get at studs and bolts. Eight sizes: 5/16" to 3/4".



FERRET FLEXEXTENSION — A flexible steel cable extension connects handle and socket to work around corners and over obstructions.

EXTRA LONG FERRET SPEEDER

36 1/2" long, 27" shank. Radius of sweep is 3/4". "Palm-Grip" handle rotates to provide easy operation.

Mechanics like this set because it is way over par in performance . . . the tools are strong and easily adaptable to a variety of jobs.

They squeeze into tight places and get those hard-to-reach nuts and bolts that defy the ordinary type wrench. Recently designed by Snap-on engineers, they have the new features that make fast, easy work of the tough jobs.

INCLUDED IN THE SET: 1/4" and 5/16" single broached sockets; 11 double broached sockets from 3/8" to 7/8"; a speeder wrench, sliding tee, 8" reversible ratchet, nut spinner and universal joint, plus a 3", 6" and 12" extension. All complete in a metal box for only.

\$27.65

SNAP-ON TOOLS CORPORATION

8026-D 28th Avenue, Kenosha, Wisconsin

Enclosed find ☐ Check ☐ Money Order or ☐ Company Purchase Order for the \$27.65 Snap-on Ferret Set.

☐ Please send illustrated brochure describing 109 individual Ferret units.

Name _____

Address _____

City _____ State _____



Fleetman's Library

Continued from Page 164

LATHE ATTACHMENT CATALOG, No. 77-U, a 28-page publication showing more than 130 attachments and accessories for South Bend Lathes and drill presses. Many of the items listed and described can be used with other makes of machines. Write South Bend Lathe Works, South Bend 22, Ind.

WELDING METHOD SELECTION, an edition of the Eutectic Welder, is an illustrated, 8-page bulletin presenting the advantages of and reasons for selecting the low heat welding alloys. Write Eutectic Welding Alloys Corp., 40 Worth St., New York, N. Y.

JANITROL BOOSTER HEATER, a new 4-page folder containing complete descriptive and specification data on the improved Janitrol heater. Aircraft-Automotive Div., Surface Combustion Corp., Toledo 1, Ohio.

DRAVCO COUNTERFLOW HEATER BULLETIN, a 12-page publication describing the company's forced air space heater. Write for Bulletin 523, Dravco Corp., Heating Section, Pittsburgh 22, Pa.

SUPERFLEX ENGINE HEATERS, a 20-page booklet illustrating and describing the Superflex all-purpose engine heater for trucks, tractors and special equipment. Write Perfection Stove Co., Cleveland 4, Ohio.

NAILPROOF STEEL FLOORING, a 4-page

folder showing installation, advantages and properties of the steel flooring for trucks and tractors. Write Great Lakes Steel Corp., Detroit 26, Mich.

GATKE BRAKE LINING CATALOG, a 16-page simplified catalog listing brake lining part numbers and prices of various types of Gatke linings. Gatke Corp., Chicago, Ill.

ALEMITE LUBRICATING EQUIPMENT CATALOGS. The full "Atomic" line of equipment is described in a 56-page catalog, Form 38-576A, which also contains suggested layouts or combinations of equipment to meet various requirements. The "Rocket" line is described in an 8-page catalog, Form 38-576B. Write Alemite Division of Stewart-Warner Corp., Chicago 14, Ill.

MATERIAL HANDLING NEWS, showing the layman what a fork-lift truck is designed to do, the comparative turning radius of solid-tired and pneumatic-tired machines, the principles of counterweighting, how turning radius affects maneuverability and other basic factors contributing to efficient operation. Clark Equipment Co., Industrial Truck Div., Battle Creek, Mich.

SHOCK ABSORBER CATALOG, a 50-page publication providing applications and detailed specifications for the full line of rotary and direct-action units, conversion kits, links, bushings and component parts. Write Houdaille-Hershey Corp., Buffalo, N. Y.

PENN DRAKE CATALOG, a 6-page folder covering the company's line of petroleum and specialty products. Write Pennsylvania Refining Co., Cleveland 4, Ohio.

WRIGHT SPEEDWAY ELECTRIC HOIST CATALOG, a 6-page, three-color folder illustrating and describing the company's hoists. Write for Catalog DH-65, Wright Hoist Div. of American Chain and Cable Co., Inc., York, Pa.

PLEXIGLAS FOR SIGNS, a 16-page booklet showing new concepts in sign design. Plastics Dept., Rohm and Haas Co., Philadelphia 5, Pa.

P AND D CATALOG, a new 80-page publication giving detailed information on the complete line of starting, lighting and ignition parts. Write for Catalog No. 49, P and D Mfg. Co., Inc., Long Island City 5, N. Y.

FUNDAMENTALS OF LIGHT AND LIGHTING, an 86-page manual providing valuable information for lighting engineers and fleetmen contemplating rebuilding or remodeling of their establishments. Book is introduced with a section on the physics of light and covers such subjects as the measurement of light, the candlepower distribution curve, lamp and luminaire efficiencies, brightness. Other sections develop field and laboratory measurements of illumination and brightness, light control. Other chapters cover diffusion, transmission, absorption and refraction. Of particular interest to fleetmen will be the subject of quantity and quality of illumination—in which such subjects as glare, shadows, intensity are discussed in detail. Part VIII provides practical information on designs for lighting systems for various types of establishments. Price of the book is \$1. Write Lamp Department, General Electric Co., Cleveland 12, Ohio, for your copy.

MOLD-BLOK

BRAKE LINING



ONE OF THE FIRST FORMS OF A WHEEL WAS A WOODEN DISC WITH HOLES THROUGH WHICH A STICK COULD BE INSERTED TO EXERT A RETARDING FORCE.

- NON SQUEAL
- LOWER COST PER MILE TO OPERATE
- UNIFORM CO-EFFICIENT OF FRICTION
- NON-SCORING OF DRUMS

MOLDED MATERIALS DIVISION
OF
CARLISLE CORPORATION
RIDGWAY, PA.

...and when
Piston Rings
need replacing—
choose the “wet” ring
that controls oil
and can’t clog!



HASTINGS
Steel-Vent Piston Rings

“TOUGH... BUT OH SO GENTLE”
TOUGH ON OIL-PUMPING • GENTLE ON CYLINDER WALLS

HASTINGS MANUFACTURING COMPANY • HASTINGS, MICHIGAN
Hastings, Ltd., Toronto
U. S. PAT. 2,148,997

Time Out For Play

(See Page 22)

Shop Magic

1. WIRE—TIRE.
2. CRUTCH—CLUTCH.
3. STRING—SPRING.
4. TACK—JACK.
5. COIN—COIL.
6. ROCK—LOCK.
7. BANK—TANK.

Purchasing Power

The greatest number of tools that he can get for his money is six, and he can get these six tools in 11 different ways, as follows:

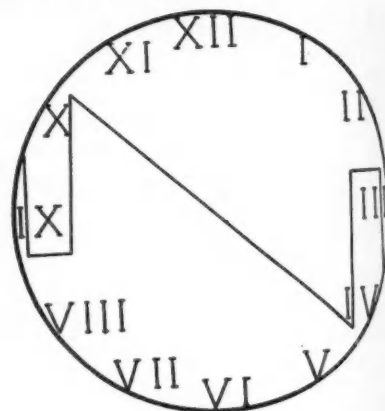
1. File, screw driver, hammer, pliers, flashlight, micrometer.
2. File, screw driver, hammer, pliers, wrench, spray gun.
3. File, screw driver, hammer, pliers, drill, jack.
4. File, screw driver, hammer, flashlight, wrench, jack.
5. File, screw driver, hammer, pliers, plane, vise.

6. File, screw driver, hammer, flashlight, drill, vise.
7. File, screw driver, pliers, flashlight, wrench, vise.
8. File, screw driver, hammer, wrench, drill, plane.
9. File, screw driver, pliers, flashlight, drill, plane.
10. File, hammer, pliers, flashlight, wrench, plane.
11. Screw driver, hammer, pliers, flashlight, wrench, drill.

Meshword Puzzle



Marking Time

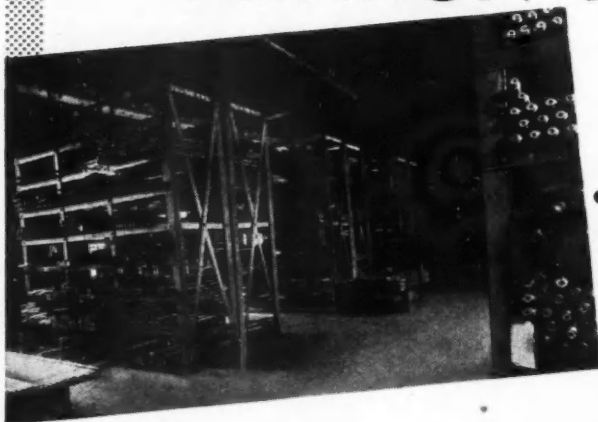


Some Fun!

The auto parts clerk dropped in his favorite bar to down a quick one or two. Just as he took the first sip from his highball, his wife barged angrily through the door. "At last I've caught up with you, you rascal, let me sample that liquid you have in your glass." Setting the highball down with a bang, she sputtered and choked, "How can you drink such horrible stuff?"

"See!" said the parts clerk, "and all the time you've thought I was out having fun."

**if U S JOBBERS
FAIL TO
MENTION THIS...**



...I want to assure every fleet owner that U.S. JOBBERS carry a constant and

complete inventory of tough U.S. AXLES. Call the U.S. JOBBER for your next axle replacement, get the benefits of quick delivery, longer lasting axle shafts proven by the records they have established in the past.

Write for latest catalog listing U.S. replacements for all types cars, trucks, also Army surplus trucks.

US AXLES

THE U S AXLE COMPANY, INC.
POTTSTOWN, PENNA.

**The Heavier Load is
in the package, too!**

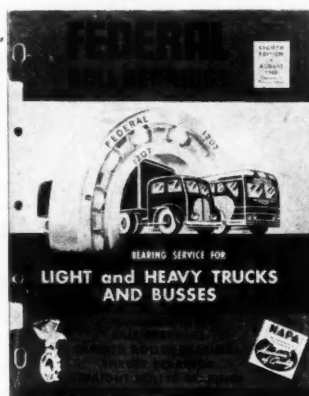


Physical-fitness is a vital "dimension" in truck and bus ball bearings with heavy-duty jobs to do. And it calls for the right degree of resilience, toughness and resistance to compression and distortion to take the overloads.

Hardening the race rings completely through is Federal's way of "building-in" the needed strength to withstand the severe pressure of the ball on the ball track, particularly under such heavy loads. Automatic electric controls insure a uniform heat-treat throughout the entire Federal hardening cycle, while a percentage of each lot of rings is crush-tested to determine load-bearing strength. The fine grain of the fracture tells the "inside" story in inspection, but more important, adds long life to the bearing on the job.

Conditioning a Federal Ball Bearing for the tougher jobs is but one of over 100 individual production, inspection and cleaning operations that go into a maximum capacity single-row radial bearing...and every fourth operator is an inspector.

Complete Bearing Service Data For Trucks and Busses Available in New 244-page Catalog



Bearing replacement tables which cover *every type anti-friction bearing* contained in all leading makes and models of light and heavy trucks and busses are listed in this comprehensive service catalog. Here is all the bearing data you need to service your equipment. Be sure to get a copy today at your nearest NAPA jobber or warehouse.

THE FEDERAL BEARINGS CO., INC. • Poughkeepsie, New York

Makers of Fine Ball Bearings

Distributed Nationally Through Local N. A. P. A. Warehouses and Jobbers



Quality since 1908

FEDERAL BALL BEARINGS

ONE OF AMERICA'S LEADING BALL BEARING MANUFACTURERS

COMMERCIAL CAR JOURNAL, April, 1949



"Say 'Ah'!"

**GET ALL THE
LUBRICATION
GOOD OIL
PROVIDES!**

**WGB Clarification Assures
Lower Lubrication Costs—
Longer Engine Life**

AND HERE'S WHY: Intensive laboratory tests prove conclusively that correctly processed, properly formed and adequately supported, fine cotton is the most efficient filtering medium for all kinds of oil. Further, WGB Clarification thoroughly cleans the oil—without removing essential addi-



tives or other lubricating qualities. The WGB Cartridge outlasts other types by a ratio of 2 to 3 . . . cuts engine repairs to a new unheard-of low—and can be changed without tools. Get to know the advantages of WGB Clarification.

W. G. B. OIL CLARIFIER, INC.
KINGSTON, N. Y.



Quiz Answers

(See Page 34)

1

The semi-elliptic type which not only acts as a spring but also resiliently positions the axles and cushions both driving torque and brake reaction, giving just as easy riding as the same amount of steel built into types a) and c).

2

d) is correct. Assembled in a "bull dozer" the spring will bend farther than it will ever go in actual service. This stresses the metal a little beyond the yield point and "pre-sets" the spring so it will not settle or sag in actual use and steering alignment will be better maintained.

3

5/8" Nut	3 foot handle
3/4" Nut	4 foot handle
7/8" Nut	6 foot handle

4

Both eyes up give the best result, even if the Berlin eye, the reinforced type or the military wrapper, is preferred.

5

SAE 3130, 4140 and 6150 are not used. Hope you didn't check the correct ones by mistake.

6

After the second repair. While good steel does last longer than poor steel, all steel eventually fatigues and it is necessary to feed some new metal into the vehicle to insure reliability.

7

True. The laminations (plates) of the leaf spring give it a high safety rating because very rarely does more than one leaf break at a time. Breakage of one leaf gives warning by feel of ride or position of vehicle body which should allow ample time for replacement before other leaves are damaged or trouble occurs.

8

c) because the middle of the spring is the point of greatest hazard and, if the U-bolts are properly tightened, the middle of the spring cannot bend. If it cannot bend it cannot break at this point.

9

In the "military wrap" of spring eyes the ends of the second leaf are loosely wrapped around the eyes of the main leaf making it possible for the vehicle to continue under its own power even though the main leaf were fractured by rough usage on the battlefield.

10

a) false	d) true
b) true	e) true
c) false	f) false

Close Shave

The freight claim agent's little girl asked her mother if there were any men in heaven. "Mamma," she said, "I never saw a picture of an angel with a beard or mustache. Do men ever go to heaven?"

"Oh, yes," replied the mother, "men go to heaven, but it's always a close shave."

INTRODUCING ...



... A. A. BALLANTYNE, former assistant to the advertising manager of the Electric Auto Lite Co. as advertising manager of the Monroe Auto Equipment Co.

... T. A. KREUSER as president of the Automotive Electric Association. He is service sales manager of Bendix Products Division, Bendix Aviation Corp.

(TURN TO NEXT PAGE, PLEASE)



... HARRY J. WASHINGTON (left) and E. M. BRADEN as regional managers for Dodge Division, Chrysler Corp., in St. Louis and Chicago respectively. ROBERT W. PEEK was also named regional manager in Cincinnati.

The following changes in personnel of the Motor Truck Division, International Harvester Co.: J. C. BULLEIT as supervisor of motor truck parts and service merchandising succeeding L. A. HANSON (see above); J. L. TEACH as manager of fleet, national and manufacturers' sales at New York City; C. L. SEARS as motor truck sales district manager at Columbus, Ohio; B. H. CRAWFORD as assistant district manager in Pittsburgh; J. S. TURNER as assistant district manager in Kansas City; S. V. ERICKSON as assistant district manager at Madison, Wis.; J. C. WHITE as assistant manager of the Shreveport, La., sales district, and W. H. DAVIS as assistant manager of the Amarillo, Tex., sales district.



... FRED LOCKWOOD as Mid-West Division manager, Automotive Replacement Sales, for Thermoid Co.



... WILLIAM H. BROWN as assistant general sales manager of Federal Motor Truck Co.



... FRANK A. SCHOTTERS (left) as vice-president and general manager of the Trailmobile Co. He was formerly vice-president of Crosley Corp. R. C. TAYLOR, JR. (right) is merchandising manager.

Now!

ON DISPLAY
AT YOUR
WILLIAMS
DISTRIBUTOR

Your Williams Distributor now shows the complete Williams line of Automotive tools on new attractive display panels.

Not pictures nor catalog illustrations but 45 square feet of actual tools from which you can select the tool or tool combinations for your particular needs.

Williams Distributors Show the Complete Line

WILLIAMS

J. H. WILLIAMS & CO., AUTOMOTIVE DIVISION

BUFFALO 7, N. Y.

INTRODUCING - - -

Continued from Page 173

... EDWARD F. FISHER as president of Gar Wood Industries, Inc. He is one of the founders of the Fisher Body Division, General Motors Corp., and comes to Gar Wood Industries after four years in retirement.

... C. S. "CHUCK" MCINTYRE III as service manager of the Monroe Auto Equipment Co.

... ALBIN A. TISSEN as Chicago Division manager, Grizzly Mfg. Co.

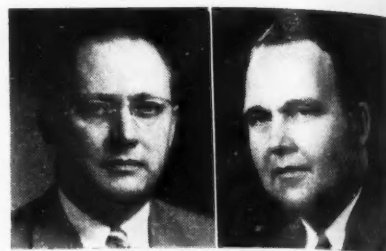
... GEORGE E. STOLL and LAWRENCE A. HYLAND as vice-presidents of Bendix Avi-

ation Corp. Mr. Stoll is general manager of the Bendix Products Division while Mr. Hyland is in charge of Bendix Aviation research.

... ARTHUR C. HELLER as president of Heller Brothers Co.

... LEWIS C. KIBBEE, formerly of Mack Mfg. Corp., as assistant to Hoy Stevens, chief of the Equipment and Operations Section, American Trucking Associations, Inc.

... J. A. PACKARD as manager, Original Equipment Sales; L. C. BUTLER as manager, Service Sales, and B. S. TOOKER as service manager of Fuller Mfg. Co.'s Transmission Division.



... J. T. SULLIVAN (left) and L. A. HANSON as managers of the eastern and east-central regions of International Harvester's truck division. These two divisions have been formed from the former eastern sales region.

... MARTIN W. CHAMBERLAIN as Pittsburgh regional manager of Dodge Division, Chrysler Corp.

... ROBERT L. BURKE as general manager of Wyzenbeek & Staff, Inc., Chicago.

... RALPH S. DAMON, president of Transcontinental & Western Air, Inc., as a director of the Goodyear Tire & Rubber Co.



... T. A. DALTON as factory sales representative in Washington, D. C. for the Federal Motor Truck Co.

... J. D. COURT-RIGHT as St. Louis branch manager of the White Motor Co. He was formerly sales manager of the Service Sales Division.



... EDWARD B. HILL as vice-president in charge of sales, Gar Wood Industries, Inc. He was formerly general sales manager.



... GEORGE E. VICTOR, succeeding his father, John H. Victor, as president, Victor Mfg. & Gasket Co.



**GET MORE TRUCK MILEAGE
LONGER SERVICE
LOWER MAINTENANCE**

KEEP 'EM CLEAN
with
HYPRESSURE JENNY
STEAM CLEANER

A FULL-POWERED, ALL-PURPOSE, EXTRA HEAVY-DUTY MODEL **NOW** FOR AS LITTLE AS

\$445⁰⁰

Hypressure Jenny often repays its cost 4 or more times a year in time and money saved by cleaning equipment *before* repairs ... removing road dirt that often adds as much as 400 pounds extra weight

to a load ... revealing cracks and defects for repair before costly road failures occur.

Hypressure Jenny cleans garage and shop floors, pits, grease racks, runways, walls, windows, etc. 8 to 10 times faster and better than you can clean them by hand.

Hypressure Jenny is compact, portable, safe and easy to use. Ordinary labor can operate it.

MAIL TODAY!

We'll make a **FREE** SURVEY of your cleaning requirements and estimate the savings you can effect with Hypressure Jenny Steam Cleaner. No obligation.

**HYPRESSURE
JENNY DIVISION
HOMESTEAD VALVE
MANUFACTURING CO.
Serving Since 1892**

REQUEST FOR SURVEY

Hypressure Jenny Division
Homestead Valve Manufacturing Co., P.O. Box 90-D Coraopolis, Pa.

We employ mechanics on repair work.

We overhaul or recondition . . . ☐ cars, ☐ trucks, ☐ buses each month.

We paint . . . ☐ cars, ☐ trucks, ☐ buses each month.

We're interested in cleaning ☐ floors, ☐ walls, ☐ windows,

We wash approximately . . . ☐ cars, ☐ trucks, ☐ buses each month.

Based on above facts, please show us the savings or extra profit **HYPRESSURE JENNY** can produce.

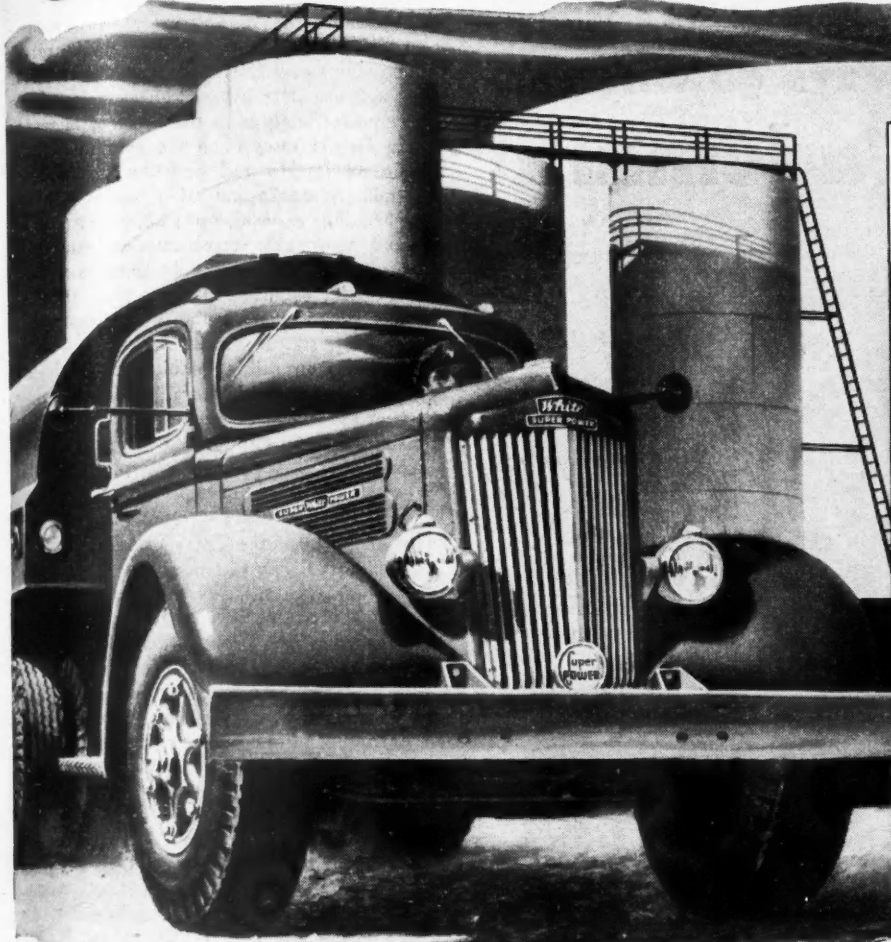
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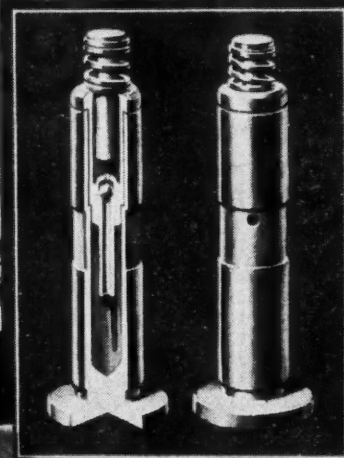
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City..... State.....

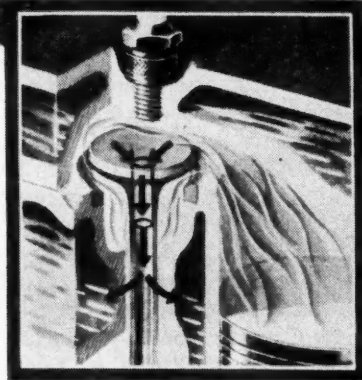
HERE IS WHY WHITES THRIVE ON HARD WORK... LONGER



QUALITY FEATURES that
make the big difference
in truck earning power



HYDRAULIC VALVE LIFTERS automatically adjust to valve expansion and contraction... eliminate tappet adjustment... assure more accurate timing and efficient valve action... save on fuel and maintenance.



SODIUM COOLED VALVES are cool-running... eliminate warping... permit higher compression ratios... improve engine performance and save on fuel. Both valves and seats are stellite-faced for long life.

EARNING POWER... in a motor truck... comes from its high quality *plus* its exact fitness for the work it does. These two essentials—high quality and selectivity—are what make White Super Power the best investment you can make in truck transportation. Creative engineering has shaved dollars off their cost of maintenance... stepped-up their fuel economy

and made million-mile records commonplace in high mileage types of service. When price and earning power are compared, the advantages of an investment in White Super Power become obvious. Let your local White Representative show you how Super Power, correctly applied to your own business, will *earn more, cost less.*



THE WHITE MOTOR COMPANY

Cleveland 1, Ohio, U. S. A.

THE WHITE MOTOR COMPANY OF CANADA LIMITED • FACTORY AT MONTREAL

FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS

IGNITION REPLACEMENT PARTS • VOLTAGE REGULATORS
FUEL PUMPS • CARBURETOR KITS • AIR COOLED COILS

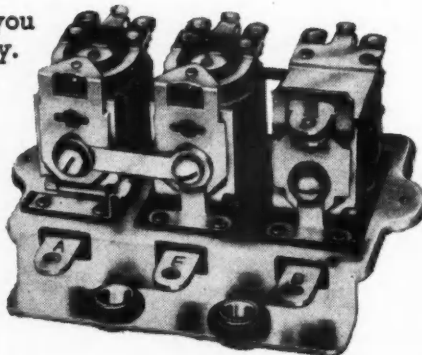
**PEE DEE says... "TOPNOTCH
TUNE-UP JOBS
always go with this
Trademark!"**



● You are always sure of customer satisfaction when you use genuine P&D products. That's because they are manufactured entirely in our modern plant from raw materials to finished products to assure long, dependable service.

The P&D voltage regulator is typical of the expert automotive engineering, finest materials, and skilled workmanship that go into all P&D parts. See the large size insulated copper magnet wire that gives the windings maximum electrical stability. Next, notice the insulation. It's made of the best laminated phenolic plate available. And the contact points are the integral type . . . built to resist pitting. The riveting shank and contact proper are especially designed to provide minimum and unvarying electrical resistance between contact and mounting.

Yes sir — P&D parts are the best you can handle to keep customers happy. Write today for your free copy of the new Catalog No. 49 giving full information on P&D brushes, bushings, cut-outs, distributor products, etc. — the one complete line of electrical parts for all vehicles.



Turn Out Better

Tune-up Jobs

With Pee Dee

P&D

MANUFACTURING COMPANY, INC.

LONG ISLAND CITY 5, N. Y.

TRANSPORTATION COMMITTEE URGES INDUSTRY RESEARCH

More active participation in transportation research by industry has been recommended by the Department of Agriculture's Transportation Advisory Committee, a group of 10 men outside government who are authorities on the transportation of agricultural products.

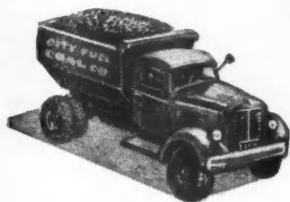
Among the high priority work recommended by the committee for 1950 are: *A continuing analysis* of data on the financial condition of transportation agencies; *more intensive analysis* of the effect of increases in freight rates upon the volume of traffic moving by rail and the diversion of traffic to trucks and other modes of transportation; *expansion of studies* on equitable and reasonable transportation rates and services to include freight rates on fertilizers, with emphasis on data as to the best location of plants in the North Central and Western states; *studies on trucks*, similar to those on railway equipment, to insure protection of agricultural products against heat and cold while in transit, and *study of methods* for compiling, keeping up to date and making regular reports on truck and water shipments of agricultural products, including processed commodities.

Members of the Transportation Advisory Committee are: Chairman, Lee J. Quasey, commerce counsel, Nat'l Livestock Prod. Ass'n, Chicago; G. W. Baxter, director, Transportation Department, Illinois Agricultural Association, Chicago; Elmer W. Cart, Public Service Commission, Bismarck, N. D.; Justus F. Craemer, commissioner, California Public Utilities Commission, San Francisco, Calif.; John H. Goff, Prof. of Bus. Adm., Emory University, Atlanta, Ga.; Chester H. Gray, Transportation Consultant, Washington, D. C.; Charles F. Hawes, traffic manager, Dairymen's League Coop. Ass'n, New York, N. Y.; Earl D. Mallison, manager, Research and Development, Atlantic Commission Co., New York, N. Y.; Gordon Stedman, secretary-manager, Growers and Shippers League of Fla., Orlando, Fla., and F. O. Terrill, The Kroger Co., Cincinnati, Ohio. Dr. Barnard Joy, assistant to the Administrator of the Research and Marketing Act, is executive-secretary of the committee.



"I don't know about food, 'mam.
All I know is why we're here."

LONG mileage on SHORT hauls...



when your trucks roll on KELLYS!

Short hauls and city deliveries mean lots of stop-and-start driving... more wear and tear on your tires.

That's why so many "short-haul" truckers are changing to Kelly Commercial Heavy Treads. For only a slightly higher first cost, they get a lot more working rubber on the road—greatly increased mileage—and a lower cost-per-ton mile.

And they take recaps better—still further decreasing the final cost per mile.

Every Kelly Truck Tire is completely up to date in improved design and materials. And they're built with the careful workmanship that has characterized Kellys for 55 years.

Kelly is the Trucker's Tire. There's a Kelly job designed for your particular type of work.

Try Kellys next and get your dividend in thousands of extra miles of service!

THE KELLY-SPRINGFIELD TIRE COMPANY
CUMBERLAND, MARYLAND

**Know-how makes
them Better!**



KELLY
REGISTERED

KELLY COMMERCIAL
HEAVY TREAD

KELLY
DUAL TRAC

KELLY
LUG TRAC

KELLY
RIB TREAD

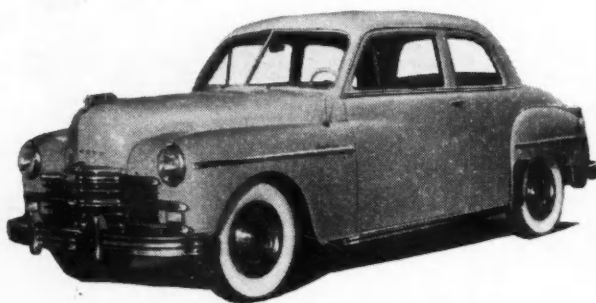
KELLY
DELIVERY TRUCK TIRE



A TOUGH KELLY FOR EVERY JOB

'49 PLYMOUTH

Features New Styling and Mechanical Improvements

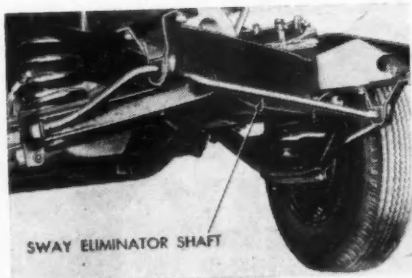


Special Deluxe Coupe on 118½-in. chassis. Shorter models have similar appearance, less trim

AS PREDICTED by advanced releases (CCJ, February, page 92) Plymouth is offering its 1949 on two different Chassis—the higher priced 118½-in. wheelbase chassis, up 1½ in. from 1948 and the lower-priced 111-in. chassis, six inches shorter than the 1948 wheelbase. The deluxe series on the 118½-in. wheelbase comprises a club coupe and a four-door sedan while the special deluxe series on the same chassis carries the club coupe, four-door sedan, convertible coupe, and the station wagon. Bodies on the 111-in. wheelbase include a two-door sedan, a three-passenger coupe, and the Suburban, the latter a new body type for Plymouth.

While wheelbase has been increased to 118½ in., overall length of the car has been decreased. Although narrower and lower the new bodies provide more interior room, sedan seats are five in. wider in front and six in. wider in the rear. Increased visibility is provided with an increase of 37 per cent in windshield area, 35.4 per cent increase in rear window opening, and with windshield wipers clearing 61.5 per cent greater area.

Plymouth features many improvements in mechanical design details, although the major elements of the car remain unchanged so far as specifications are concerned. Engine performance and efficiency have been improved with the introduction of a new cylinder head which increases the compression ratio to 7 to 1. The ratio was 6.6 to 1 last year. The increase in compression ratio coupled with other changes has stepped out-



SWAY ELIMINATOR SHAFT

Improvements in front suspension include new sway eliminator shaft

NOW YOU CAN



There was a time when engine parts could be expected to look like this after 18-25,000 miles of operation.

Now, however, the super lubrication of internal combustion and diesel engines with Miracle Power and dgf-123 can double or triple engine life.

put to 97 hp at 3600 rpm, an increase of two horsepower over last year.

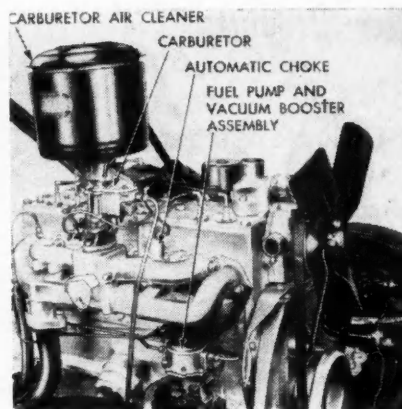
The engine has a new intake manifold which is said to promote quicker and smoother warm-up and faster response to throttle opening. A new automatic electric choke, of the same type used on other Chrysler Corp. cars, has been added. In addition, Plymouth has adopted the combination ignition and starter switch which is standard on all Chrysler Corp. cars.

A radical change has been made

in piston ring setup with the introduction of a chromium plated top ring and improved oil rings.

The electrical system has been improved with the adoption of the splash-proof distributor, combining a 10,000-ohm resistor in the cap for reducing interference with radio and TV reception. At the same time this permits use of a wider initial spark plug gap, resulting in improved idling and better low speed, light load operation.

Headlights now are equipped with



New engine details include automatic choke and vacuum booster

PREVENT THIS

For instance, one fleet owner, operating 70 heavy duty trucks with wartime gas and oil reported these results from the regular use of Miracle Power over a six months period: "Cylinder wear reduced at least 30% . . . sticky valves almost entirely eliminated . . . saving of 13½% on oil cost . . . valve grinds reduced approximately 30% . . . rebuilt motors run more freely in ten minutes than they ran with two hours operation without using this additive."

Miracle Power and dgf-123 are available from leading automotive parts distributors everywhere.

Write, wire or phone
The AP Parts
Corporation for free
technical bulletins.



THE **AP** PARTS CORPORATION • TOLEDO 1, OHIO

MUFFLERS • PIPES • MIRACLE POWER • dgf-123

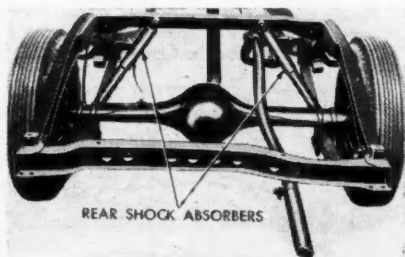
a bulls-eye lens in the center of the sealed-beam lens to provide increased light output. A new enclosed circuit breaker, interchangeable with those used on other Chrysler Corp. cars, replaces the fuses used heretofore.

While the suspension system remains substantially unchanged, better riding is promised by the use of diagonally mounted shock absorbers at the rear, and increased rebound control in front shock absorbers. Further gain is made by newly designed rubber limit bumpers. The new mounting of rear shock absorbers allows for greater road clearance and reduces side sway by providing greater stability.

A new type of fresh air car heater, offered in three models, is said to step up defrosting and remove window fog more readily. It is located under the hood and may be used in warm weather as an air circulator.

There has been adopted the type of seat construction which allows the addition of extra spring coils to suit the weight of occupants, if desired.

Engine and other components on the 111-in. wheelbase chassis are the same as those on 118½ in. chassis except for dimensional changes due to the shorter wheelbase.



Rear shock absorbers are now mounted diagonally to minimize side sway

New Products

Continued from Page 52

P197. New Gasket

A new type of gasket, made of electrically annealed steel with aluminum-fused-oxide finish has been developed especially to withstand the pressures in the new, higher compression engines. The steel is tempered to provide compressibility and resiliency and is then electrically coated

with aluminum-fused-oxide to be rust-proof and easy to remove the next time the head is taken off. The Fitzgerald Mfg. Co., Torrington, Conn.

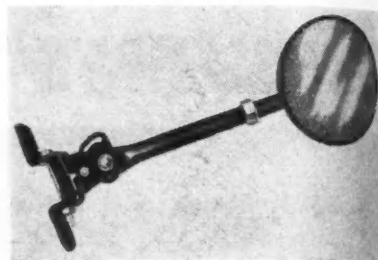
P198. Trailer Connectors

Shur-Lock connectors for tractor-trailer hook-up are available in large rectangular types or the new round types, 4 and 6-way units. Features of the connectors include automatic locking covers to protect against weather, safety shear points to pre-

vent cable breakage should the operator fail to uncouple, interchangeable repair parts and heavy durable stampings in body and parts. Contact points will not corrode, spark or arc, according to the company. Automatic wiping action is provided through the design of female contacts, while the wide, bronze-plated contacts on male end permit greater amperage and voltage. Berg Mfg. and Sales Co., Chicago, Ill.

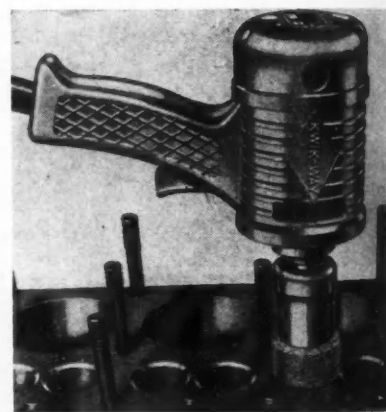
P199. Rear View Mirror

This new mirror features the preset stop which can be lifted to clear any obstruction and return to its



original position without further adjustment. A lock nut feature prevents adjustment. (TURN TO PAGE 182, PLEASE)

P200. Valve Seat Grinder



For those hard-to-get-at jobs Model NSG Kwik-Way Valve Seat Grinder may be your answer. This tool is designed especially for grinding valve seats in passenger car and light truck engines with the engine in the chassis. It is available with quick-change angle drives which permit it to work close to the firewall or other tight spots. Motor unit weighs only 4 lb and services all valve seats from 13/16 in. to 2 1/2 in. Ball bearing grinder unit is used with new, shorter shank arbor with 13/32 in. top diameter. Special spring loaded lunger holds grinder wheel off work when motor is started or stopped. Cedar Rapids Engineering Co., Cedar Rapids, Iowa



From an insulated body . . .
to a 45°-50°
refrigerated
truck.

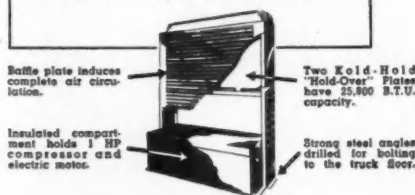
*Name on request

As simple as 1-2-3

with KOLD-HOLD'S
new *Pakage* truck unit

Hi-temperature refrigeration of perishables is achieved quickly, easily and economically through the installation of the new "Pakage" truck unit. This unit is a completely self-contained refrigeration system which you can install (see right) in from two to three hours without special body work, holders or brackets. It works well in any properly insulated body, regardless of age and it maintains a 45° to 50° temperature throughout the longest day's deliveries. The unit recharges itself by simply plugging in to any 110V outlet. 220V motor is available if desired. Write for the "Pakage" truck unit bulletin for information.

1. Cut two holes in the floor of the truck for air intake and discharge. Dimensions and measurements come with the unit, as well as complete installation instructions.
2. Push the unit into position over the holes and bolt securely into place. This is all the installation required.
3. Plug into 110V outlet. Twenty foot rubber covered cord is supplied with the unit. If desired, a connection box may be installed outside the body for greater convenience.



Baffle plate induces complete air circulation.

Insulated compartment holds 1 HP compressor and electric motor.

Two Kold-Hold "Hold-Over" Plates have 25,000 B.T.U. capacity.

Strong steel angles drilled for bolting to the truck floor.

WRITE FOR THIS FREE LITERATURE!
Efficient Truck Refrigeration, "Pakage" Truck Unit, and separate bulletins on Truck Refrigeration for Meat, Milk, Ice Cream and Frozen Foods.

KOLD-HOLD

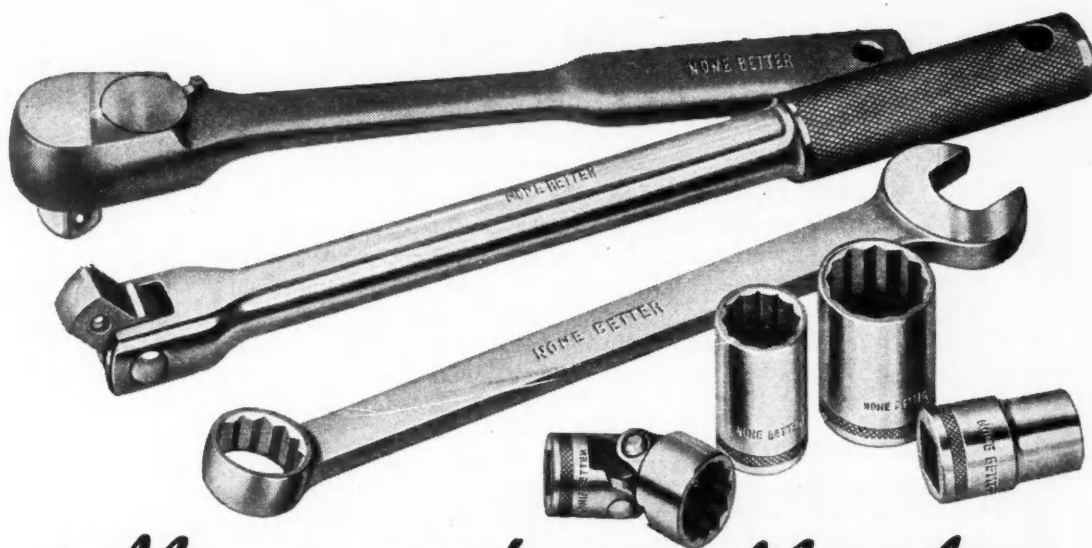
Jobbers in Principal Cities

KOLD-HOLD MANUFACTURING CO. 620 E. Hazel St., Lansing 4, Michigan

PROCESSING protects every step of the way

STORAGE

TRANSPORTATION



*It's your Money and your Muscle....
So, why not Save both with —*

NONE BETTER

HAND TOOLS



Looking for value in Hand Tools? You'll find it in NONE BETTER... the big VALUE that's your best bet for long-run economy. These quality Hand Tools live long, useful lives. They're famous for durability . . . outstanding for compact, modern design . . . and handsome in their bright, triple-plated, Chrome Finish. They're made to give you more for your Hand Tool dollar!

PRACTICAL HAND TOOLS

NONE BETTER Hand Tools produce on the job! They give you the working speed that fleet maintenance requires. Each Tool is planned for maximum utility . . . planned for tough, heavy-duty action . . . you get more done with less effort. Drive Parts have that long-reaching slimness and easy-handling light weight. Sockets have that snug non-slip fit on the nut! And you've never handled Wrenches that pack more pull into less bulk!

A COMPLETE LINE

NONE BETTER value is part and parcel of every Tool in this com-

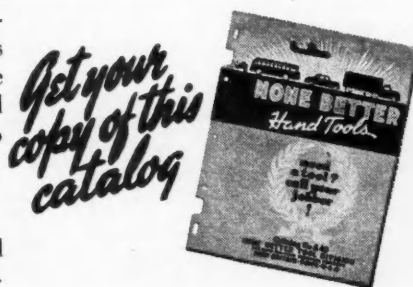
plete Line. There's a full range of Hand Tool selection, covering every phase of truck repair and maintenance. You'll find balanced, economical Sets of all types, and individual Tools for every specialized service need.

GUARANTEED

NONE BETTER Hand Tools are fully guaranteed. Write TODAY for the name and address of your nearby NONE BETTER Jobber . . . he's the man to see for Hand Tools that save you money and muscle!

NONE BETTER HAND TOOL DIVISION

The New Britain Machine Company
New Britain, Conn.



New Products

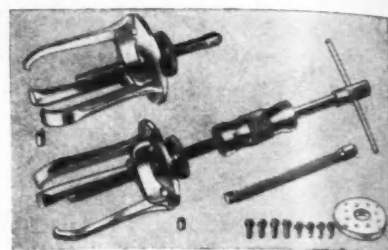
Continued from Page 180

vents the shaft, which is adjustable from 19 to 29 in., from twisting or slipping, stops chatter and vibration. A ball stud mounting allows the mirror greater versatility of adjustment. Finished in heavy, double-dipped, baked black enamel. Grate Mfg. Co., Bellevue, Ky.

P201. Snap-On Puller

This new addition to the puller line known at the CG-273 is a three-jaw puller that produces safe, uniform power and can easily be used by any mechanic. Spring tension holds the jaws on the work, and a locking nut makes it possible to lock the puller on the job so it will not come off until released. This allows the operator to use both of his hands for the actual pulling operation. Jaws are forged and specially heat treated.

Maximum jaw capacity on outside holds is $8\frac{1}{2}$ -in. Jaws are reversible to operate through a $2\frac{1}{2}$ -in. opening



for inside pulls on bearings, sleeves, etc. The yoke is forged with two sets of jaw slots allowing the jaws to be moved closer to the center for better gripping power on small jobs. Puller is available as either a screw type or combination of screw and booster hammer type. Snap-on Tools Corp., Kenosha, Wis.

MOST COMMON COMPLAINTS

POOR SPRING CONSTRUCTION . . .	110	
POOR SEAT UPHOLSTERY	118	91%
POOR STITCHING and BINDING . .	82	
OTHER	31	
TOTAL	341	



IN ORIGINAL EQUIPMENT

91% OF SEAT COMPLAINTS*
CAN BE AVOIDED by installing
TRAVEL COMFORT CUSHIONS

*The survey from which these figures were taken covered 176 fleets . . . 27,198 vehicles. That's a big sample. And a lot of complaints! Of truck seats commonly used, only 10% were found satisfactory.

You can avoid the most common faults . . . with a maximum of convenience and economy.

Install McInerney Travel Comfort Cushions. They are engineered to fit your cab design. The cushion spring constructions are developed scientifically for your particular vehicle, then upholstered and covered by expert "tailors" in your choice of materials. All you do is set them in the job.

The construction of Travel Comfort Cushions is fully guaranteed. You are assured of finest spring construction, superior upholstery and excellent workmanship throughout. And drivers of your vehicles will enjoy sustained comfort because Travel Comfort Cushions are designed to eliminate road shock and thereby lessen riding fatigue.

THE WAY TO BETTER SEATING: McInerney seating engineers will gladly work with you in developing comfortable, trouble-free seating units for your vehicles.

McInerney

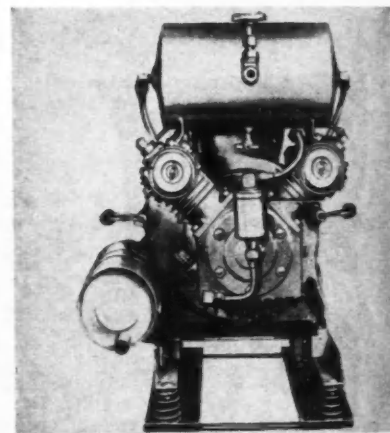
SPRING & WIRE COMPANY

407 DODGE AVENUE, S.W. • GRAND RAPIDS 5, MICHIGAN

P202. Air Compressor

The "Little Workhorse," a new 7 c.f.m. lightweight compressor consists of a "V" type, 2 cyl, single-stage compressor direct connected to a $4\frac{1}{2}$ -hp aircooled engine. Compressor has a $2\frac{1}{2}$ -in. bore with $1\frac{1}{4}$ -in. stroke and operates at 3000 rpm.

The unit is equipped with an automatic centrifugally-actuated clutch



which momentarily frees engine from compressor for starting, but re-engages at about 1500 rpm. The machine is designed for operation in all temperatures and is tested for the range of -65 deg. F. to $+130$ deg. F. Continuous operating pressure is 100 lb, but the unit may be run intermittently up to 150 lb pressure. Overall dimensions are: length, 29 in.; width, 21 in.; height, 27 in. Weight is 117 lb. Davey Compressor Co., Kent, Ohio.

(TURN TO PAGE 184, PLEASE)

Why you should get in your anti-freeze now

—and why it should be made by Du Pont

It's the old "early bird" story. The fleet owner who places his order for anti-freeze now—and takes delivery as soon as possible—is making sure that he gets an adequate supply of the brands best suited to give him good performance next winter.

And what brands will give him that performance? You know the answer. No matter what types of vehicles you may have in your fleet, no matter what the service, or in what kind of weather—there's a Du Pont anti-freeze that will fill the bill.

"ZERONE" is tops for economy when used with normal opening thermostats (160° F. or below) on light- and medium-duty vehicles. Made from the most efficient of all known safe anti-freeze materials, "Zerone" needs only an occasional check-up. Its special chemical inhibitor retards rust and corrosion—helps keep a clean cooling system clean.

"ZEREX" is Du Pont's permanent-type, ethylene glycol anti-freeze. It's ideal for engines that operate in the 180° to 200° F. range. "Zerex" won't boil out at high temperatures and still protects against freezing at sub-zero levels when trucks are not in use. Like "Zerone," "Zerex" contains a special chemical inhibitor with a high "alkaline reserve" that gives exceptionally long-lasting protection against rust and corrosion. "Zerex" won't attack rubber, seep from tight cooling systems, or clog radiators. There's no better anti-freeze.

* REG. U. S. PAT. OFF.

There still may not be enough "Zerone" and "Zerex" to meet the big demand for these products. But you can expect your jobber to receive deliveries of these Du Pont anti-freezes earlier this year than ever before. Take advantage of this fact and accept deliveries as soon as your wholesaler can supply you.

Remember—no matter what kind of vehicles you operate, you can count on a Du Pont anti-freeze to protect them.



BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

New Products

Continued from Page 182

P203. Off-the-Road Tire

Latest addition to the Cooper heavy-duty truck tire line is the Lugger Traction Tread.

Tire body has extra strength under the tread, plus extra reinforcement at the shoulders and sides to uniformly distribute and absorb impact and shock accounts for unusual service. The Lugger Traction Tread is adapt-

able to most off-the-road and on-the-road operations.

Present production has been concentrated on sizes 8.25-20, 9.00-20 and 10.00-20 in 12 and 14-ply ratings. Cooper Tire & Rubber Co., Findlay, Ohio.

P204. Parts Cleaner

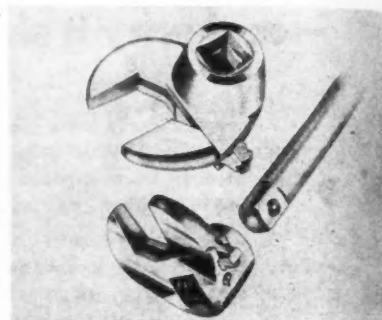
Improvements in the formula for Kelite No. 555 have been announced. Formula 555 is non-phenolic, non-flammable, non-toxic, and non-injurious to the skin. It is faster acting

than the previous formula, and has greater penetration, a longer life, less evaporation, no disagreeable odors, superior rinsing qualities with plain tap water, and is safe on all metals, according to the manufacturer. Kelite Products, Inc., Los Angeles, Calif.

P205. Adjustable Wrench

Here is versatility and convenience in a single tool. A detachable socket system with all the advantages of the open-end adjustable wrench is a feature of this new tool.

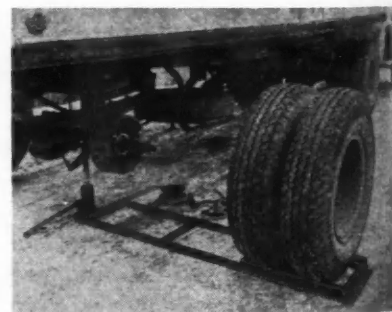
Adjustable Crowfoot attachments, when used with the various handles and parts available, offer new ways to approach difficult service problems.



Made from selected alloy steel two square drive sizes are available, $\frac{3}{8}$ in. and $\frac{1}{2}$ in. with capacities of $\frac{3}{4}$ in. and $1\frac{5}{16}$ in. respectively. Square shoulders on the body portion of the sliding jaw provide maximum and positive bearing against working stress. J. H. Williams & Co., Buffalo, N. Y.

P206. Dual Wheel Dolly

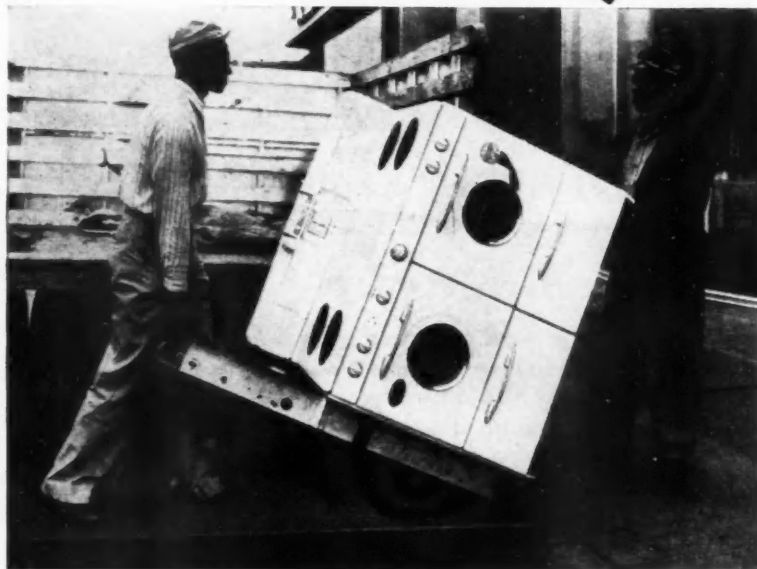
Tire and wheel handling is easier with this new unit. This new Dual Wheel Dolly consists of a track and dolly, is light and portable (weighs



35 lb) but will handle all sizes of wheels.

The truck is jacked up about 4 in., (TURN TO PAGE 186, PLEASE)

Less Delay
the CEMCO way



CEMCO *Hydraul-Lift* TAILGATE

A Cemco Hydraul-Lift Tailgate offers unusual opportunities to speed deliveries, increase payloads, lessen hazards of trucking.

Can handle up to one-ton with absolute safety. No strained backs. No waiting for enough men to lift a heavy load. No wonder truckers want to drive the truck equipped with a Cemco Tailgate. Operator can raise, lower or stop load at any level of gate.

There's a Cemco to fit most any truck or semi-trailer—new or old!

Write for specifications and details.

CEMCO INDUSTRIES, INC.,
GALION, OHIO

For Safety's Sake.

YOU CAN'T BEAT THIS WAGNER 3-R COMBINATION



1

REFILL...

with genuine WAGNER LOCKHEED BRAKE FLUID

It is an all-season brake fluid that mixes with all other approved brake fluids. It is unsurpassed for dependable performance, and recommended for all hydraulic brakes.

2

RELINE...

with WAGNER CoMaX BRAKE LINING

Unsurpassed for quick, safe, smooth stops. Long-lived because the ingredients wear slowly; it doesn't compress or swell; has uniform frictional qualities. The CoMaX line provides complete coverage for all brakes. Produced in rolls, blocks, sets or slabs.

3

REPAIR...

with genuine WAGNER LOCKHEED BRAKE PARTS

Recommended for superior quality, perfect fit, and dependable performance. Backed by Wagner's years of experience in designing and manufacturing brakes for original equipment. Available either in complete kits or as assembled cylinders, through Wagner wholesalers everywhere.

For added safety... get Wagner Air Brakes—the only air brake with the Rotary Compressor

Wagner Electric Corporation

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LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • NoRoL
CoMaX BRAKE LINING • AIR BRAKES • TACHOGRAPHS
ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES

You can depend on WAGNER Quality because:

WAGNER PRODUCTS ARE USED AS ORIGINAL EQUIPMENT BY AUTOMOBILE MANUFACTURERS

AP-3

New Products

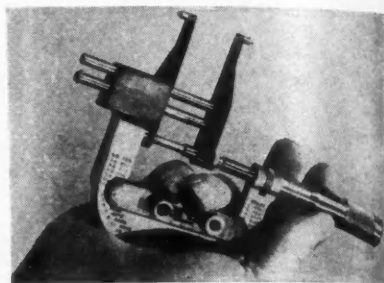
Continued from Page 184

the track is placed under the wheels, and the dolly is rolled under so that when the truck is let down part way, the wheels rest securely in the dolly frame. An easy pulling motion slides the wheels, carried on the dolly, out from under the truck in perfect alignment. The Biddle Co., Bloomington, Ill.

P207. Microdapter

For taking internal measurements with outside micrometers an improved model of the Microdapter is available. This low-cost attachment for outside micrometers permits taking precision internal measurements. Operation is easy even in locations ordinarily inconvenient or inaccessible to conventional inside micrometer sets. Since the measuring points are cone-shaped and project beyond each leg, they readily reach into internal

grooves, into recesses, behind shoulders, and in deep bores. The attachment clamps instantly and securely to any micrometer frame and measurements are read directly on the regular thimble with original microm-



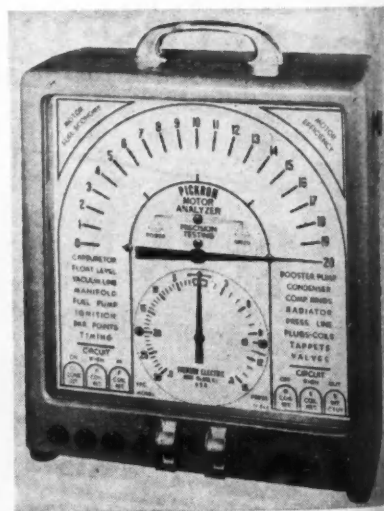
eter accuracy. A pre-set zeroing adjustment matches distance between tips with micrometer opening. Once set, measurements are duplicated with any micrometer.

Microdapters are available in stock sizes from 1-in. mikes covering a range of 1/2-in. to 1-in.; for 2-in. mikes covering 1-in. to 2-in. and for 3-in. mikes covering 2-in. to 3-in. Rimat Machine Tool Co., Glendale, Cal.

P208. Engine Analyzer

For that spring tune up, here is a new instrument. It is a portable engine analyzer constructed and adapted with a minimum of hook-up connections and features simplicity in operation and construction, and is said to complete engine checks in a matter of minutes.

Reaction of engine performance on a full 180-deg. sweep scale amplifies



the slightest adjustment results made on component parts. Following adjustments can be made with instrument. (TURN TO PAGE 188, PLEASE)

"Cleveland" Door Controls

Furnished in
Full Nickel
Plate Finish.

No.
2321A



"CLEVELAND" DOOR CONTROLS are built for rugged endurance . . . built to take all the knocks and hard wear Commercial Busses are subjected to. Yet users marvel at their smooth, quiet operation.

CLEVELAND PIVOT BEARING CONTROL

The hub moves on two cone-shaped, self-lubricating pivot bearings of hardened steel. All bolts are fastened with castellated nuts and cotter pins to allow easy adjustment of wear. It locks the door both open and shut with absolutely no rattle.

"Safety First" Control



FOR

SCHOOL BUSES

No. 2322A

HERE'S a SPECIAL "CLEVELAND" DOOR CONTROL DESIGNED FOR SCHOOL BUSES. Already used on hundreds of busses from coast to coast because of its advantages over ordinary controls. It is DURABLE, DEPENDABLE, EASILY OPERATED and A BIG AID TO SAFETY. Cadmium plated finish.

SEND FOR CATALOG 22-B

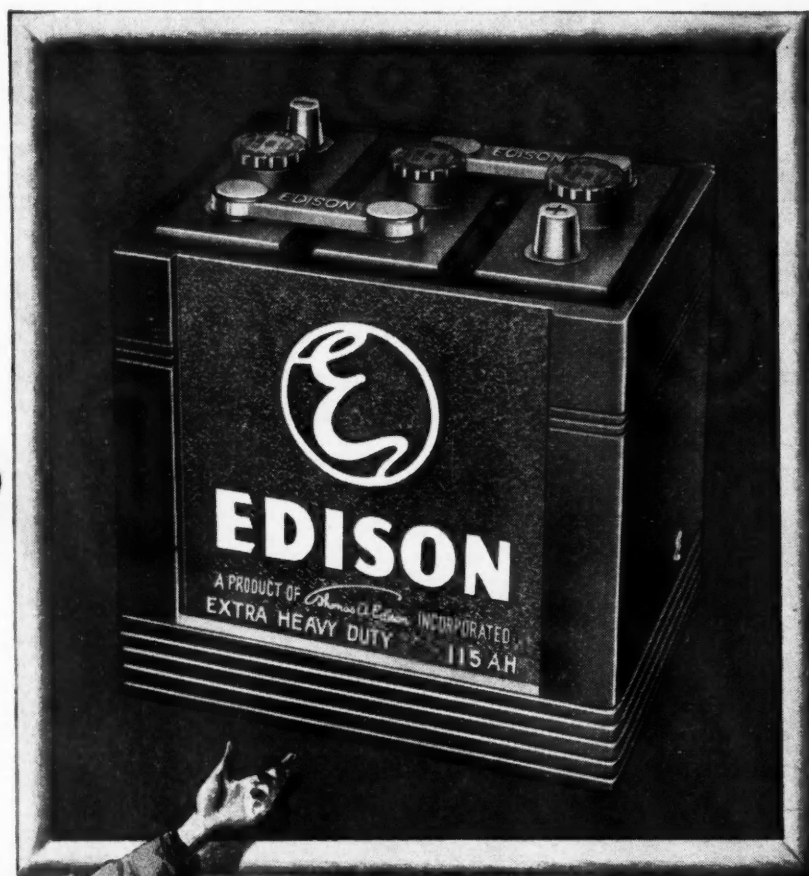
The Cleveland Hardware & Forging Co.

3264 East 79th St.

Established 1881

Cleveland 4, Ohio

"You really
want the
straight dope?"



"So you think all batteries are pretty much alike? That's like saying a setter and a poodle are the same thing because they both have four feet and a tail.

"You take the Edison Extra Heavy Duty Battery. Sure, it's got that 'drinkless' feature all modern batteries have. That means it has to be serviced less often. But it has lots more, too. No matter how old the truck or how rough the road, you can't shake an Edison plate loose. And it has seepage-proof covers that prevent acid-overflow. And those special Endurite separators—they make it possible for an Edison to last 50 percent longer than an ordinary battery. Those are the sort of things that make an Edison really stand up . . . save you money.

"Take my word for it, that battery has everything! Why, I've been to the plant and watched them being made. Know how many times they're inspected? Yessir, 106. You can't convince me all batteries are alike. I'm for Edison every time. Same way about their spark plugs. You switch to Edison, and you'll get *performance as great as the name.*"

EDISON

BATTERIES • SPARK PLUGS

You can always rely on an Edison



Thomas A. Edison

THOMAS A. EDISON, INCORPORATED
Automotive Division, West Orange, New Jersey

New Products

Continued from Page 186

ment: dual or single carburetors, valves, manifold heat riser, spark plugs, fuel pump, booster pump, ignition coil and condenser. Pickron Electric, Rock Island, Ill.

P209. Tire Hammer

A truck tire hammer designed to permit driving between rim and tire,

breaking loose and driving stubborn heads off rims has just been developed for truck and auto tire changing work. Special tapered head is extra long, curved to fit rim, allows operator to drive bead way down on rim, if necessary, before handle strikes top of rim edge. Ken Tool Mfg. Co., Akron, Ohio.

P210. New Type Ratchet

This new tool for nut and screw turning, the Speedratchet, has a com-

pact and rugged construction with counterbalanced handle. At least four tools in one, the Speedratchet functions as a minimum clearance speeder, ratchet and extension, counterbalanced spinner, or as a combination ratchet T-handle with new palm grip. It has a standard 3/8-in. reversible drive, and features a new fire resistant plastic handles. Herbrand Div., The Bingham-Herbrand Corp., Fremont, Ohio.

P211. Heavy-Duty Tire

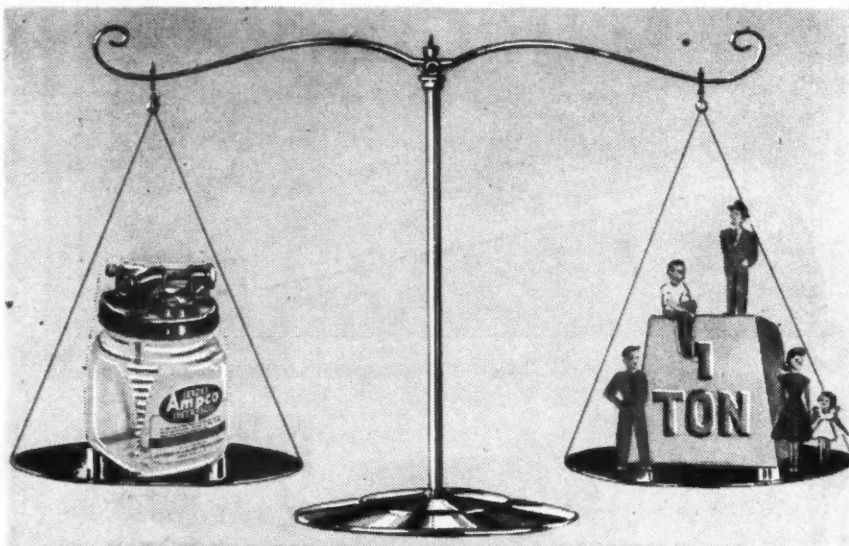
A new type tire known as the Hard Rock Rib is currently being manufactured in three sizes, including 12.00-24, 13.00-24 and 14.00-24.

It is designed especially for front wheel service in heavy construction, excavation and strip mining and is expected to help eliminate hard steering and vibration encountered in these types of operations.

Tread design of the new tire consists of three, heavy circumferential ribs, with the shoulder pattern resembling that of the company's standard Hard Rock Lug tire. The Good-year Tire & Rubber Co., Akron, Ohio.

P212. The Roto-Cap Gage

The Roto-Cap Gage is a special purpose tool designed to determine the valve tip-cap spacing so important in the Continental engines which use the rotating valve set-ups. It will en-



add AMPCO and you add more tons or more passengers

AMPCO Prevents



Carbon and gum frock, valves and pistons.



Gum varnished cylinder walls



Gum and carbon clogged piston rings



Carbon coated pistons

Make this simple test — take any two of your fleet — same make, same model, same run — put an AMPCO Vapor Lubricator on one, don't put it on the other. Then keep score! You'll find the AMPCO-equipped truck or bus travels *more miles* between lay-ups, travels them faster, travels them cheaper. The difference is noticeable! AMPCO gives you more pay load (greater power), more pay hours (greater speed), and more pay miles (lower fuel and oil consumption). It keeps your fleet on the road and out of the shop — not all the time, but much longer. That's equivalent to carrying more tons or more passengers at a lower cost per mile.

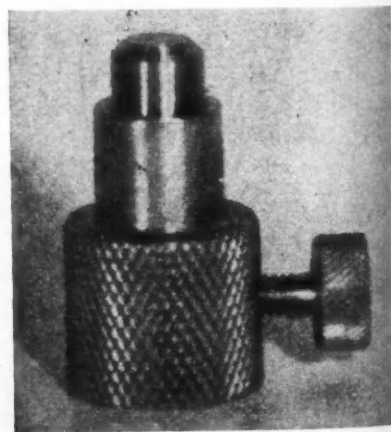
AMPCO is the oil source for an engine's heat-wear zone to save wear on valves, rings, pistons.

Powerful Performance Positive Lubrication
—for all Internal Combustion Engines.



AUTOMOTIVE & MARINE PRODUCTS CORP.

87 HARVARD AVENUE, BOSTON 34, MASS.



able any mechanic to measure easily and conveniently the exact roto-cap length necessary to allow the valve to rotate which will not interfere with the tappet clearance setting. Cleveland Hard Facing, Inc., Cleveland, Ohio.

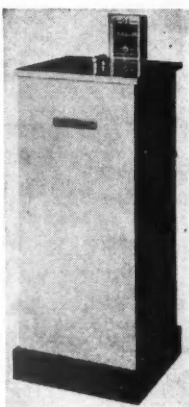
(TURN TO PAGE 191, PLEASE)

New Products

Continued from Page 188

P213. Vapor Degreasers

The new "Cub" hot vapor degreaser, the "Cub," is entirely automatic — cleaning parts in a matter of minutes. The solvent is heated, creating clean, hot solvent vapor, which penetrates the grease, oil, grime and sludge to the bare metal parts being degreased, where it condenses on the colder metal, continuing to wash away the soil until the parts have been completely degreased. All surfaces of the "Cub" coming in contact with vapor are of stainless steel construction. Circo Products Co., Cleveland, Ohio.



P214. Pressure Tank

This 2-gal. pressure tank model N400, is completely galvanized, both inside and out, is painted on the outside, and has a concave bottom with a reinforcing skirt.



The top, which has a working pressure of 50 lb. per sq. in., is made of heavy-duty cast iron that is painted to prevent rusting, and is attached to the tank with four high tensile brass swivel bolts. Tank comes equipped with a forged brass regu-

lator, a full size pressure gage, a combination blow-off relief valve, and a brass material outlet. The Black Mfg. Co., Baltimore, Md.

P215. Electrical Connections

Koiled Kords are coiled retractile electrical connections between tractor and trailer that extend and retract as the need arises. Properly installed between cab and trailer, they are said to eliminate danger of electrical wires being torn loose by catching on

projecting corners, couplings, handles or moving parts while on the road. These lines extend as the need arises to approximately five times their coiled length and retract to their original neatly coiled size when the pull is relieved. Koiled Kords, Inc., Hamden, Conn.

P216. Rubber Lubricant

A new rubber lubricant-penetrant preserves, protects, lubricates and prolongs the life of rubber mountings, (TURN TO PAGE 196, PLEASE)

you name it—

**The new Airco 700 Welds It
...from thin metal to 2" plate**

Why? Because this new torch uses tip assemblies that range all the way from Size 00 through No. 10.

This wide tip selection makes the Airco 700 suitable for 90% of your welding work — and when equipped with a multiflame tip, it is unbeatable for silver and aluminum brazing.

Each welding tip is assembled with an individual mixer drilled for that particular tip. In addition to wide tip selection, the NEW "700" also features: better flame control... perfect balance... and low maintenance cost.

With the addition of a cutting at-

tachment, the "700" can be easily converted to handle general shop cutting work.

If you would like more information about this torch, or a free demonstration right in your own shop, address Dept. 8944, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.



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Headquarters for Oxygen, Acetylene and other Gases... Carbide... Gas Welding and Cutting Machines, Apparatus and Supplies... Arc Welders, Electrodes and Accessories

TRIPLE PURPOSE

OIL FIELD VEHICLE

By **LEO HUFF**

Manager Motor Transport Dept.
The Pure Oil Co., Chicago

OUR COMPANY has recently put into use two unique truck tractor units which serve a triple duty in oil field work. The one illustrated on



FIG. 1. Pure Oil Co.'s basic power unit showing frame-mounted winch, removable gin poles and special 5th wheel with bolsters on top section

Signal-Stat Saves Lives!

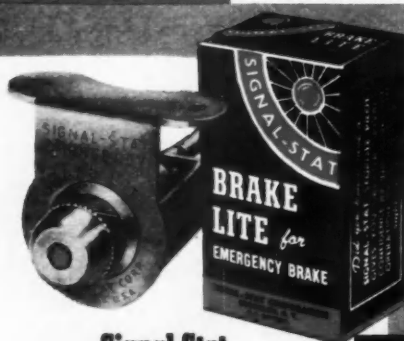
STANDARD EQUIPMENT ON NATIONALLY ADVERTISED MOTOR TRUCKS



Signal-Stat

**DIRECTIONAL SIGNALS
FEATURING THE PATENTED
BURN-OUT-PROOF SWITCH**

A switch that has failed may cost lives. The Signal-Stat Directional System features the only Burn-Out-Proof switch. Fleet and truck operators favor Signal-Stat because of its great dependability. The only switch that can be used with or without flashers. Lamp specifications include aluminum reflectors, brass sockets, rim gaskets, special lenses, maximum visibility. Multiple position mountings eliminate need for extra parts and permit mounting to variable positions without base adaptors. Wired, ready to install. Reduces accidents and saves on insurance premiums.



Signal-Stat BRAKE-LITE

An instant flash reveals emergency brake is on. Perfect insurance against wear and burning out brakes and clutch. Installed in no time. Packed in colorful counter merchandiser.

Approved by:

- States requiring directional signals
- S.E.M.A. Safety Equipment Manufacturers Association
- A.A.M.V.A. Association of American Motor Vehicles Administrators certificate No. 1

**Other Signal-Stat Products:
FUSE-IN-LINE RECEPTACLES
EMERGENCY BRAKE LITES
STOPLITE PILOTS**

CATALOG AVAILABLE SHOWING COMPLETE LINES

Signal-Stat CORPORATION

SIGNAL-STAT BUILDING

1430 Herkimer St., Brooklyn 33, N. Y.

these pages was modified at our Olney, Ill., shops and is in service at Worland, Wyo. The other, a similar unit, was modified at our Tulsa, Okla., shop. Each is designed for use with either a pole trailer or a float-type trailer or as a derrick rig using removable gin poles.

The big problem in handling heavy oil field machinery is high center of gravity. When operating with these heavy loads under difficult conditions, often with no highways at all and in mud, sand, and snow, it is extremely important to keep the weight down. This vehicle was adapted with this fact strongly in mind.

Fig. 1 shows the unit ready for use as a derrick and for the mounting of a pole trailer. It will be noted that the winch is mounted behind the cab in the usual manner with the exception that it is mounted directly on the frame instead of at the usual standard bed height. The removable gin poles are self-explanatory and provide an excellent means of handling and loading heavy equipment. There has also been mounted a standard fifth wheel with both lower and upper plates. On the upper plate a pair of bolsters have been permanently mounted by welding as well as a standard fifth wheel king pin. This entire upper fifth wheel section, which is used with a standard pole-type trailer, can be quickly detached in a single piece. At the extreme rear of the unit is a unique rolling tail pipe. (See photo and description at right.)

Fig. 2 shows the same unit with a standard pole-type trailer attached. This type of unit has the distinct advantage of saving between 5000 and 6000 lb over the float-type trailer, hence we insist on this type of unit being used for the handling of tubular goods, rods, etc., where we can gain the additional payload and also have

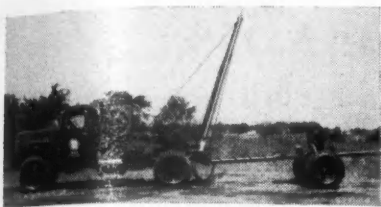


FIG. 2. Tractor with pole trailer

the advantage of the lower center of gravity.

Fig. 3 shows the same tractor with the gin poles and special upper fifth wheel plate with bolsters removed and a standard float unit attached. This is used for the handling of cement, dirt, wire, line fittings, crawler tractors, and oil field machinery.

Fig. 4 gives a full view of the special rolling tail pipe which is partially visible in the other photographs. This device permits the float to be dropped to the ground at its front end so that any self-powered machinery such as crawler tractors or road equipment can be driven into position on the float. After the load is aboard the front end may be raised quickly by means of cable over the rolling tail pipe to the truck winch. This winching operation pulls the other off the upper and lower fifth wheel plates together in a standard manner.

Fig. 4 also gives a good view of the gin pole fittings on the special upper fifth wheel plate with bolsters mounted. It should also be noted that the float is fitted with stake pockets around the side which permit the

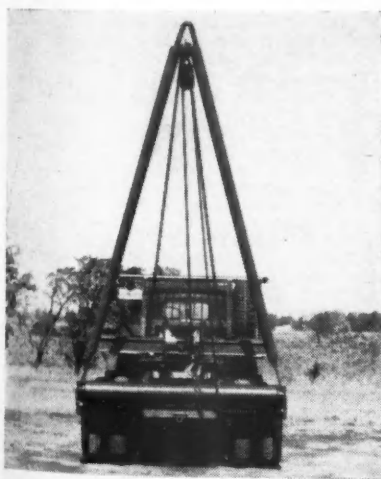


FIG. 4. Rear view of tractor showing rolling tail pipe which permits hoisting of float with load. Note also gin poles and bolster on upper 5th wheel

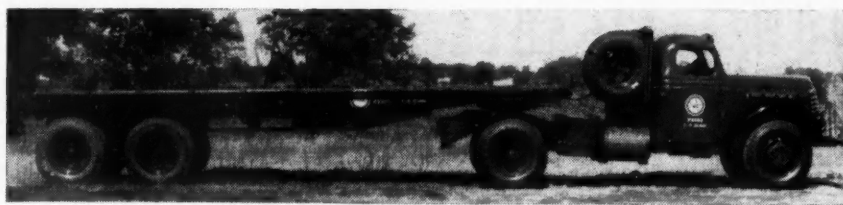


FIG. 3. Same tractor without gin poles and upper 5th wheel, used with float

mounting of side boards for use when bulk material is handled.

The tractor is a standard General Motors unit and the pole trailer was

purchased from Shirley Mfg. Co. The float was a Fruehauf unit. All of the special equipment, however, was de-
(TURN TO NEXT PAGE, PLEASE)

Put Your Money on the

Thermoid Line

**Built for
Heavy
Duty
Service**



Thermoid Radiator Hose has proven to be better where it counts —on the road, under the toughest conditions. Precision made with Multi-Ply wrap, Thermoid Radiator Hose is impervious to hot water and anti-freeze. It lasts longer and lowers maintenance costs. Start saving money now by using

Thermoid Radiator Hose on *all* your equipment.

The Thermoid Line

Brake Linings • Clutch Facings • Fan Belts
Radiator Hose • Hydraulic Brake Parts and Fluid
Car Mats • Thermoid Precision Process Equipment
Complete Brake Service Departments

Thermoid Company, Trenton, New Jersey

NOW AVAILABLE IN U.S.A.

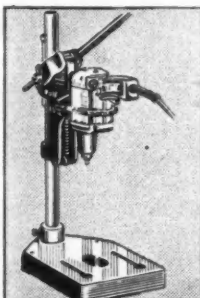
THIS PRECISION-BUILT ENGLISH TOOL

**Noted for Fine Craftsmanship
HALF A CENTURY IN 50 WORLD
MARKETS WINNING RECOGNITION
FOR HIGH QUALITY**



**THIS 1/4" LIGHTWEIGHT ALL-BALL BEARING
PRODUCTION DRILL IS AMAZINGLY VERSATILE
AND DURABLE!**

This is a popular drill with automotive manufacturers, body workers, and repair men. The low weight, short overall length and offset spindle makes this machine particularly suitable for drilling in confined spaces and prevents fatigue in the operator. The ratio of speed to power gives additional scope to the Service Garage proprietor in the operation of decarbonizing brushes and valve guide cleaners on engine reconditioning work.



BENCH DRILL STAND TYPE ESI

**OTHER WOLF
PRODUCTION
TOOLS COMING
SOON**

GH6 6-inch Hand Electric Grinder	NW6C 3-inch Electric Drill
VSM 7-inch Portable Electric Sander	NWSI Electric Screw-driver
CM4 Electric Chisel Mortiser	NWB Portable Electric Blower
EV63 Electric Valve Seat Grinder	HD2 Electric Hammer Kits

FINE ENGLISH TOOLS Every one of them performance proved. Prices, deliveries and distributor particulars on request.

**S. WOLF & COMPANY LIMITED
LONDON**

Warehouse Stocks and Service Depot—New York City. Address inquiries to U.S. Factory Representative, Fred L. Stuart, Room 1111, 33 W. 42nd Street, New York 18, N.Y. LA 4-2255.

Triple Purpose...

Continued from Page 193

signed and fabricated in our own shops as previously noted.

Both of these units has been in service approximately eight months and have given excellent results. There is no question in our minds that we will continue to build more of them. They are not a cure-all and will not take the place of the standard four or six-wheel drive trucks and there are still many cases where a low-bed trailer with gooseneck front is needed for the handling of extremely heavy equipment.

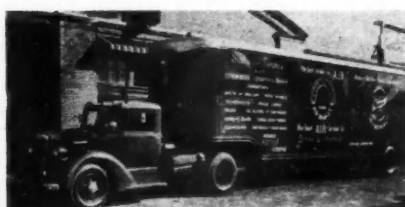
We still have a human factor in making sure that the field operating personnel use the equipment best suited for the particular job in hand and I refer again particularly to the great weight saving advantage of the pole type trailer for handling the long loads adaptable to this type of vehicle.

It Depends Who!

The president of Fleety-Fleet Motor Express was entertaining at dinner in one of the swankiest downtown clubs a group of technicians from the factory of a prominent motor truck manufacturer. With a great flourish of hospitality, the fleet owner ordered the fanciest steaks on the menu to be served to his guests. When the steaks were placed before them, he was quite chagrined at the smallness of their size, and cast his eyes about as if to compare them with steaks served to diners at adjoining tables. Finally, his gaze came to rest on the plate of a man seated at the next table, wherein lay a steak twice as large as those served to him and his guests. Angrily he summoned the head waiter: "I demand to see the manager at once!"

"Sir," exclaimed the headwaiter, pointing to the man eating the out-size steak, "that gentleman is the manager."

Mobile Brake Shop



The Power Brake Co., a Westinghouse Air Brake distributor in the Carolinas, completely equipped this drop-frame Trailmobile as a work shop on wheels. There are three skylights in the roof, a brake drum lathe, test benches and plenty of bins for parts storage

All Budd Wheel distributors can provide the same kind of service illustrated on the opposite page

AKRON—Motor Rim Manufacturers Co.
ALBANY—Wheels, Incorporated
ALBUQUERQUE—Wheels & Brakes, Inc.
ATLANTA—Harris Automotive Service, Inc.
BALTIMORE—R. W. Norris & Sons, Inc.
BIRMINGHAM—Cruse-Crawford Wheel & Rim Co.
BOSTON—New England Wheel & Rim Co.
BUFFALO—Frey, the Wheelman, Inc.
CHARLOTTE—Carolina Rim & Wheel Co.
CHICAGO—Stone Wheel, Inc.
CINCINNATI—Rim & Wheel Service, Inc.
CLEVELAND—Motor Rim Manufacturers Co.
COLUMBUS—Hayes Wheel & Spring Service
DALLAS—Southwest Wheel, Inc.
DAVENPORT—Stone Wheel, Inc.
DAYTON—Rim & Wheel Service, Inc.
DENVER—Quinn & McGill Motor Supply Co.
DES MOINES—Des Moines Wheel & Rim Co.
DETROIT—H. & H. Wheel Service, Inc.
FARGO—Wheel Service Company
GRAND RAPIDS—Rim & Wheel Service Co.
HARRISBURG—Standard Wheel & Rim Co.
HARTFORD—Connecticut Wheel & Rim Co.
HOUSTON—Southwest Wheel, Inc.
INDIANAPOLIS—Indiana Wheel & Rim Co.
JACKSONVILLE—Southeast Wheel & Rim Co.
KANSAS CITY—Borbein, Young & Co.
KNOXVILLE—Harris Automotive Service, Inc.
LOS ANGELES—Wheel Industries, Inc.
LOUISVILLE—Auto Wheel & Rim Service
MEMPHIS—Beller Wheel, Brake & Supply Co.
MILWAUKEE—Stone Manufacturing Co.
MINNEAPOLIS—Wheel Service Co.
MOLINE—Mutual Wheel Co.
NASHVILLE—Beller Wheel, Brake & Supply Co.
NEWARK—Automotive Safety Inc.
NEW HAVEN—Connecticut Wheel & Rim Co.
NEW ORLEANS—Southern Wheel & Rim Co.
NEW YORK—Wheels, Incorporated
OKLAHOMA CITY—Southwest Wheel, Inc.
OMAHA—Morgan Wheel & Equipment Co., Inc.
PEORIA—Peoria Wheel & Rim Co.
PHILADELPHIA—Thomas Wheel & Rim Company
PITTSBURGH—Wheel & Rim Sales Co.
PORTLAND—Six Robbles, Inc.
PROVIDENCE—New England Wheel & Rim Company
RALEIGH—Carolina Rim & Wheel Co.
RICHMOND—Dixie Wheel Co.
ROCHESTER—Frey, the Wheelman, Inc.
SALT LAKE CITY—Henderson Rim & Wheel Service
SAN ANTONIO—Southwest Wheel, Inc.
SAN FRANCISCO—Wheel Industries, Inc.
SEATTLE—Six Robbles, Inc.
SOUTH BEND—Wire & Disc Wheel Sales & Service
SPOKANE—Bearing & Rim Supply Co.
SPRINGFIELD, ILL.—Illinois Wheel & Brake Co.
SPRINGFIELD, MO.—Borbein, Young & Co.
ST. LOUIS—Borbein, Young & Co.
SYRACUSE—Colbourn Wheel & Rim Service, Inc.
TACOMA—Six Robbles, Inc.
TOLEDO—Wheel & Rim Sales Co.
WICHITA—Borbein, Young & Co.

EXPORT

CLEVELAND—C. O. Brandes, Inc.

CANADA

CALGARY—Fisk Tire Service Ltd.
EDMONTON—Alberta Wheel Distributors, Ltd.
MONTREAL—General Auto Equipment Ltd.
TORONTO—Wheel & Rim Co. of Canada, Ltd.
VANCOUVER—Wheels & Equipment, Ltd.
WINNIPEG—Ft. Garry Tire Service Ltd.





Mileage Contract Tire Supplier Pays Bonus

AND WHY WOULDN'T they when Arkansas Motor Coaches, rolling up 200,000 miles a month between Memphis and Texarkana, increase their tire mileage 40% by changing over to Budd Wheels with wide base rims!

We got the story from salesman Jim Davis by way of Malcom Berg of Beller Wheel Brake & Supply Co., Budd Wheel distributors in Nashville and Memphis.

"Our mileage is far above the average and expectation of our tire supplier, for as you know we operate on a mileage basis, our tires being supplied by one of the major rubber companies" say Messrs. McClendon and

Wilson of Arkansas Motor Coaches. "Those wheels are *really* paying for themselves, and then some."

While those Arkansas folks have got themselves a good thing, there's plenty left for others. Why don't you have the Budd Wheel distributor near you check over your equipment. Look him up in the column on the adjoining page. Doesn't cost anything to find out if you can save money with a change-over—not just any change-over, but one that's exactly right . . . the kind you can get with Budd Wheels, the only *complete* line with the new tapered bead seat rims.

The Budd Company, Detroit 14, Michigan.



Look for this label (in blue, red and gold) on the rim of every genuine Budd Wheel.

New Products

Continued from Page 191

grommets and fittings. It keeps rubber parts soft and pliable and can be used for quieting squeaks and other noises. Lubricant can be used for mounting and dismounting of tires, tubes and flaps. Applied with the handy brush applicator along the tire beads and inside the tire, it prevents premature tire and tube failure. Radiator Specialty Co., Charlotte, N. C.

P217. High Pressure Lubricator

This new one-man, one-hand-operated lubricator said to make changing an easy operation. A push-squeeze handle enables the operator to develop pressure up to 7500 lb without air or electricity. Ten feet of hose facilitates rapid servicing of hard to reach fittings without moving the lubricator. The greaser fits any standard 25 to 40-lb original container and requires no tools in installation. K-P Mfg. Co., Minneapolis, Minn.

HERE'S EVERYTHING YOU WANT

**IN A
HEAVY
DUTY
JACK**



This man is not wrestling the weight of a heavy truck wheel. The weight of the wheel is carried in the channel of the **DRUM SAFETY JACK**. He did not crawl under the truck to spot the jack—DRUM'S automatic spotting device took care of that. Speed up tire and wheel changes with a **DRUM SAFETY JACK**—approved by leading fleet operators, tire companies and truck manufacturers.

**SAFE
QUICK
EFFICIENT**

Models for every purpose:
1½-3-5-8-12 TON sizes.



See your jobber or write to:

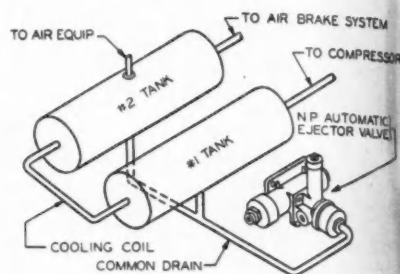


THE CLEVELAND PNEUMATIC TOOL CO.
3769 East 77th Street • Cleveland 5, Ohio

P218. Water Ejector

Having trouble with water accumulation in your air tanks? Try this. The "NP" C-43100 Automatic Water Ejector Valve is a self-contained, air-operated unit which automatically removes water and other fluid foreign matter from air reservoirs. No electrical heating elements are required with this valve, which operates efficiently at air pressures of 75 to 125 lb.

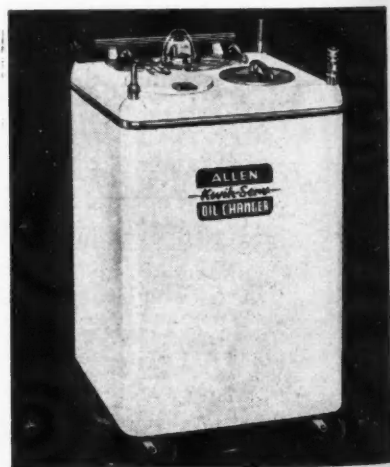
The ejector incorporates a two-



position rotary valve, an air cylinder, and a water-collecting sump. When air pressure is applied to the piston in the air cylinder, the rotary valve is turned, first disconnecting the sump from the air tank, then connecting the sump to the drain. When air pressure is removed from the operating piston, the rotary valve is turned to its other position; first closing the connection between sump and drain, then connecting the air tank with the sump. One or more tanks can be drained by the ejector. National Pneumatic Co., New York City.

P219. Fast Oil Changer

A new fast oil changer is claimed to completely drain and refill oil in



less than 3 minutes. A 3-way selector valve enables operator to fill reservoir with new oil while crankcase is (TURN TO PAGE 198, PLEASE)

MORE DELIVERIES PER DAY... **LESS DRIVER FATIGUE.....**

**VICKERS
HYDRAULIC POWER
STEERING**

**VICKERS
HYDRAULIC DRIVE
FOR HOSE REEL AND
PRODUCT PUMP**

Heavy front wheel loading on tank trucks makes hard work of manual steering. But steering is easy on these Socony-Vacuum trucks because they have "finger tip" Vickers Hydraulic Power Steering. This avoids driver fatigue—greatly improves maneuvering in cramped quarters.

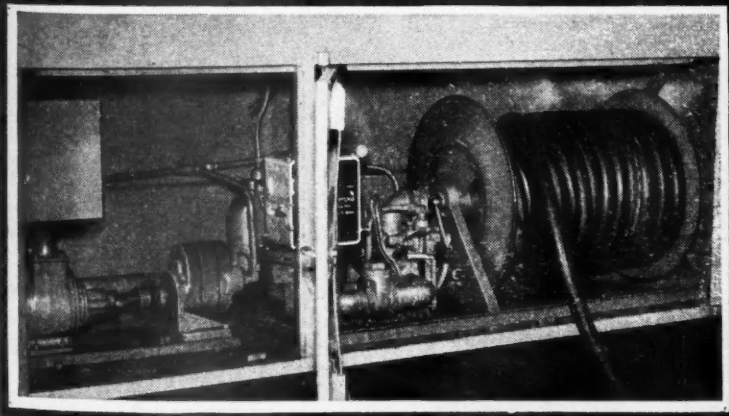
Vickers Hydraulic Drive for the hose reel and product pump has solved several difficult problems. On any type truck it avoids complicated mechanical transfer from the power take-off. On semi-trailer type trucks, it provides the only fully satisfactory way to get power from the tractor engine to the product pump and hose reel. Hydraulic power can be applied wherever hose lines can be run.

When the driver of this truck is ready to make a delivery, he simply pushes the hydraulic control lever back. This starts the product pump and frees the hose reel. A valve in hose nozzle prevents product flow until hose connection is made—the product pump discharging through a bypass valve. When nozzle valve is opened, the bypass automatically closes and product flows. Driver does not have to walk back to the truck. On completion of delivery, he closes nozzle valve, returns to truck and pulls control lever forward. That stops the product pump and engages the hydraulic drive to the hose reel, winding in the hose.

This Vickers Hydraulics application is engineered to deliver product in the shortest time with the least amount of effort for the driver.

Consider the advantages of Vickers Hydraulics for your drive problems, which may provide a better solution at lower cost and with less maintenance.

(Below) Vickers Hydraulic Motor drives product pump at extreme left. Hydraulic control valve is next to reel.



VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1418 OAKMAN BOULEVARD • DETROIT 32, MICHIGAN

Sales Engineering and Service Offices: ATLANTA
CHICAGO • CINCINNATI • CLEVELAND • DETROIT
LOS ANGELES • NEWARK • PHILADELPHIA • ROCK-
FORD • ROCHESTER • SEATTLE • ST. LOUIS
TULSA • WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

New Products

Continued from Page 196

being drained. As soon as old oil is removed, selector valve is turned to refill position and new oil is immediately pumped into crankcase. Selector valve in empty position discharges old oil into storage drum. Allen Electric and Equipment Co., Kalamazoo, Mich.

P220. Rol-A-Lifts

Two new Rol-A-Lift models have been designed to handle crated or uncrated materials and products where loads are too heavy or bulky for fork trucks.

Model M-2, has a 2000-lb capacity and is especially suited for moving long counters, freezer units, storage bins and similar bulky items. The M-2 is built with adjustable forks to accommodate crates of varying width and operates with a mechanical cam

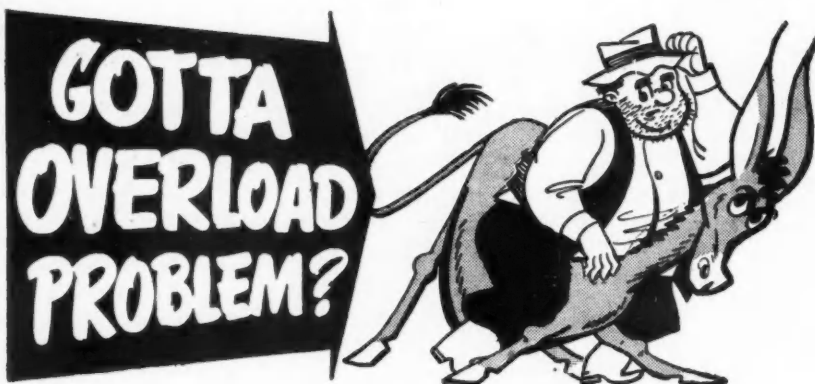
lift. The other new model, the M-8, has an 8000-lb capacity. It is suitable for moving heavy production machinery as well as heavy, bulky crated products, palletized units or similar material. The Skarnes Engineering and Supply Co., Minneapolis, Minn.

P221. Drum Trucks

An improved three-wheeled carrier is designed to lift, transport and release any size or type of steel drum, wood barrel or cylindrical fibre container. Model 800 Series now available is designed for loads up to 850 lb in 50 to 60 gal sizes. Ernst Drumobile Div., Brantwood Plastics, Inc., Buffalo, N. Y.

P222. Hydraulic Ram

A small unit with big possibilities, the new Amazon Hydra-Pull ram features a special center hole which runs through the full length of the ram, allowing the use of a drawbar and giving a direct pull of far greater pressure. Designed for use in bending, straightening, assembling, pressing, pushing and pulling. Pump cylinders are mirror finished, and pump pistons are highly polished. Ram is



YOU CAN LICK IT!

BODY BUOYS
Float the Overload

**EXTRA Load Capacity of 750 to 9000 lbs.
for TRUCKS, TRAILERS, TRACTORS** SINCE 1935

A Body Buoy Assembly to Fit Any Load Requirement

They're inactive with vehicle running light or empty. They go into action under excessive load to CUSHION the overload, reduce body sway and driver fatigue—prolong truck life.

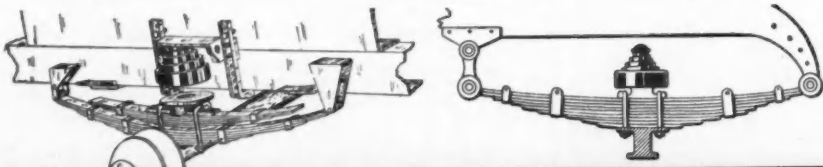
Your dealer now carries several Coil sizes, interchangeable on your Assembly. This means he "custom-fits" Body Buoys to your particular overload requirements.

... Dare You to Send for the Proof!



Also Assemblies for Passenger
Vehicles Hauling House Trailers

AUTOMOTIVE AIDS CORP.
3532 W. Fort St., Detroit 16, Mich.




FOR FRONT OR REAR APPLICATION



separated from pump by a quick coupling flexible hose enabling it to operate freely in any position. Various attachments that extend to 8 ft and thread easily on ram are available; all are interchangeable with the three rams on the 10 ton Hydra-Pull. Sunset Hydraulic Co., Los Angeles.

(TURN TO PAGE 200, PLEASE)



**Who's crazy?
I get \$2 an hour
to be a carbon
scrubwoman**

Ferrex gets carbon—in the hot tank. Why pay high-priced mechanics to scrub carbon by hand? New Ferrex gets carbon in your hot tank because it is two materials instead of one. Gets other dirt, too. 100% clean parts save mechanics' time, permit accurate inspection. Work moves faster, stays on the road longer. Ferrex can save you money.

**"GET CARBON OR NO PAY"
offer proves it**

Turco will charge your hot tank with two-part Ferrex and show you, in your own shop, the best hot tank cleaning you've ever had. If you don't agree that Ferrex gets carbon better, and dirt too, the trial costs you nothing. Write or call!



FERREX gets the carbon

Turco Products, Inc., Main Office: 6135 South Central Avenue, Los Angeles 1
Factories: Chicago, Houston, Los Angeles, McCook, Ill. ★ Service Centers and Sales Offices in Principal Cities

New Products

Continued from Page 198

P223. Improved Condensers

A newly designed and improved condenser features fully soldered connections between condenser section and terminal wires at each end, vacuum impregnated windings, oil sealed elements, hermetically sealed metal containers, part number identification, plastic insulated connection

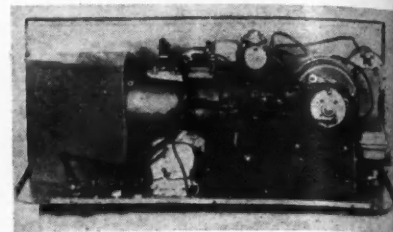
wires, doubly held terminals with mechanical on insulation and solder on wires. The F. & B. Mfg. Co., Chicago, Ill.

P224. Cargo Heater

New heating unit using the Stewart-Warner 20,000 Btu South Wind heater in a self contained package, is designed to thermostatically maintain correct temperatures in the transportation and delivery of beverages, drugs, dairy products, bakery goods,

beer and other products that might easily be damaged by cold weather.

It is used to assure safe handling of winter crops of vegetables subject to extreme changes in temperatures.



Heater is easily installed. All component parts are contained in a single cabinet. Unit features low operating cost, with performance of 1/4 gal gasoline consumption per hour at "high heat" and 1/10 gal at "low heat." Dromgold and Glenn, Chicago, Ill.

P225. Battery Charger

The new Star Model Chargalyzer (fast battery charger and analyzer) features a dynamic cell balance analyzer to indicate in one single reading any unbalance existing in the three cells of a battery. The Charging Time Sensor represents a new method of

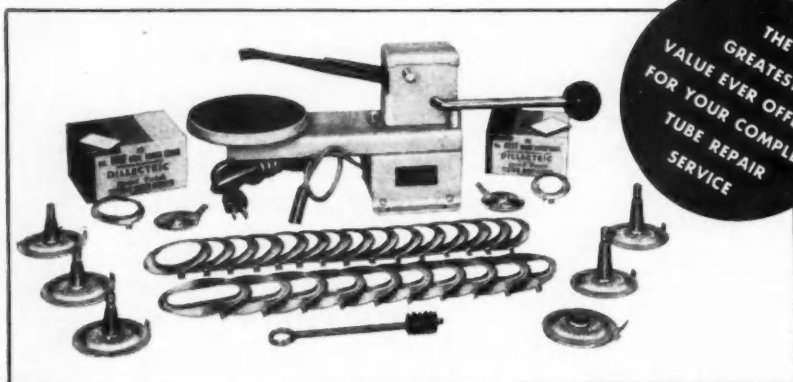


timing the fast charge. Automatic temperature compensation insures proper charging at all temperatures. An improved timer automatically reduces the fast charging rate to a slow or finishing charge. McCollin-Christie Corp., Ltd., Gardena, Cal.

P226. Brake Booster

Incorporating a new design the Rocket Hydraulic Brake Booster for passenger cars and trucks provides (TURN TO PAGE 202, PLEASE)

Profit WITH THIS NEW De Luxe DILLECTRIC TUBE VULCANIZING OUTFIT



THE
GREATEST
VALUE EVER OFFERED
FOR YOUR COMPLETE
TUBE REPAIR
SERVICE

No. 6688
COMPLETE OUTFIT

ONLY \$14⁸⁵

Here's What You Get —

- 1 No. 6685—DE LUXE PRESSURE CLAMP with transformer for 110 or 125 or 220 volt A.C.
- 50 No. 6611—ROUND PATCH UNITS.
- 50 No. 6612—OVAL PATCH UNITS.
- 15 No. 6608—LARGE ROUND PATCH UNITS.
- 10 No. 6607—LARGE OVAL PATCH UNITS.
- 5 VALVE STEM UNITS (3 No. 1415, 2 No. 1425).
- 1 No. 6617—WIRE BUFFER.

TO THE
100,000
DILLECTRIC USERS

Your present standard Dillelectric Pressure Clamp is not exchangeable for the new De Luxe Model. However, the lifetime guarantee of your present clamp can be made uninterrupted by buying the new Dillelectric Pressure Clamp.

No. 6685 DILLECTRIC PRESSURE CLAMP ONLY, INCLUDING WIRE BUFFER—\$7.50

Materials for \$75.00 Worth of Tube Repairs with the New De Luxe Pressure Clamp FEATURING

New OPERATING LEVER—New cam design does away with screwing down pressure arm. Simply pull the lever forward to stop-pin for exact uniform pressure on all repairs. Eliminates guesswork—saves time.

New PRESSURE ARM—Cantilever spring incorporated in arm design automatically equalizes pressure on all repairs regardless of thickness of tube and repair.

New PRESSURE PAD—Larger, softer natural rubber pad, contained by metal rim, compensates for irregularities in tube and repair thickness. Assures perfect feather-edge repairs.

New "OFF" AND "ON" INDICATOR—Now protected from dirt, moisture and damage by enclosure in a transparent plastic cover.

New STURDY CONSTRUCTION—Designed with a minimum of moving parts and strongly made for hard usage with trouble-free service.

GUARANTEED FOREVER—If at any time, regardless of date of purchase, a Dillelectric Pressure Clamp becomes damaged or requires repair of any kind, we will either recondition it to perfect working order or replace it at our option with a new one of the same model at no charge whatsoever.

*Write for complete descriptive folder

THE DILL MANUFACTURING COMPANY
700 East 82nd St., Cleveland 3, Ohio
Branch—1011 S. Flower St., Los Angeles, Calif.

DILLECTRIC
Speed Patch
ELECTRICALLY VULCANIZED
TUBE REPAIRS



MORE MILES • MORE SATISFACTION

with Belden

SPARK PLUG WIRES

Belden 7777

Belden 7799

Belden 7789

**Battery Cables • Spark Plug Wires
Lighting Wires
Cordlites, Extension Cords, and Tools**

Belden
Automotive **WIRE**

New Products

Continued from Page 200

extra brake pressure for emergency stops as well as longer brake life. Less brake "grabbing" due to equalized brake application and less skidding because of simultaneous four-wheel brake application is said to result.

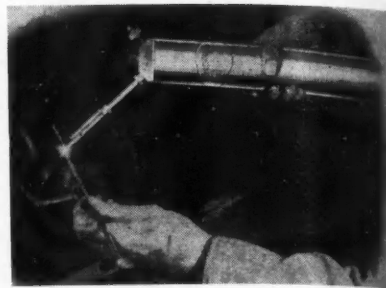
Installed between the master cylinder and the brake lines the booster

is available in 4 models: Model FC and OC for passenger cars, Model TOC for $\frac{1}{2}$, $\frac{3}{4}$ and 1 ton trucks and Model TC for $1\frac{1}{2}$ and 2 ton trucks. South Gate Brake Specialties, South Gate, Cal.

P227. Hand Torch

The new ICC approved Torchmaster is a general utility, self-contained hand torch using liquid petroleum gas (Butane, Propane, etc.) as fuel. It has a filtered "Wind-Pruf" tip

which produces a variable sootless flame for light brazing, all types of soldering, and other heating applications.

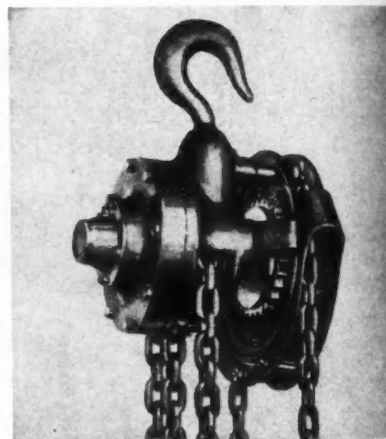


Compact ($2\frac{1}{4}$ by 13 in.), the torch is easy to handle and convenient to carry. One filling will last the average working day in continuous use. Industrial Engineered Products Co., Los Angeles, Cal.

P228. Heavy-Duty Hoists

A new line of Auto-Bloc lightweight, portable heavy-duty hoists is now available in 16 standard models of $\frac{1}{2}$ to 40-ton capacities.

Simplified hoisting mechanism employs only two gears and makes possible weight savings. Gears are a cam-actuated floating inner gear and an outer gear to which the load sheave is rigidly connected. Each pull on



the hand chain causes the cam shaft to revolve, actuating the floating inner gear. The inner gear moves eccentrically over the inner circumference of the outer gear. But, held in one position relatively by 8 hardened steel balls, it cannot rotate. David Round & Son, Cleveland, Ohio.

P229. Armored Clearance Light

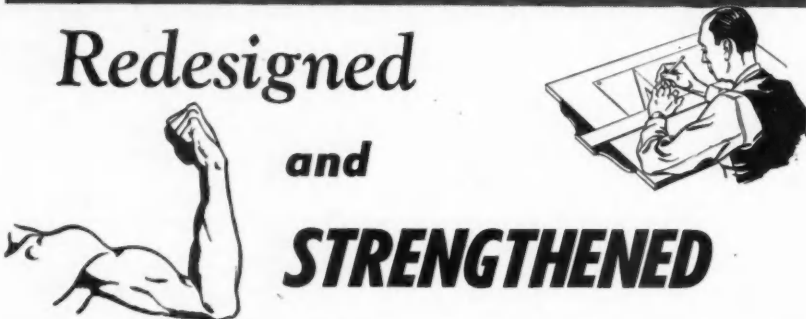
K-D armored clearance lights now available are offered with a steel base (TURN TO PAGE 204, PLEASE)

Holland TRUCK AND TRAILER EQUIPMENT

Redesigned

and

STRENGTHENED



To meet today's increased demands of truck-trailer equipment.

Holland Hitch's new equipment is far sturdier than ever before. It has been designed to provide reliable service under even the most rugged operating conditions. Write for full information on the new Holland truck and trailer equipment.

for **SAFETY . . . ECONOMY . . . DEPENDABILITY . . . SERVICE**

Look to Holland
for assistance with
your truck equip-
ment problems.

**Use Holland Engineered
Truck and Trailer Equipment**

- FIFTH WHEELS
- PINTLE HOOKS
- LANDING GEAR
- COUPLERS



HOLLAND HITCH COMPANY
HOLLAND MICHIGAN



AC QUALITY OIL FILTER ELEMENTS

Dirt-Proof your engine oil

Any engine is a better engine if its oil is "Dirt-Proofed" with an AC Quality Oil Filter Element. It performs better, longer. It costs you less to operate because it is kept free from the dirt, sludge, and other contaminants which clog rings and valves, waste fuel and oil, and wear out moving parts.

You want engine power and efficiency held high. AC Quality Oil Filter Elements help do it. There's a size "Job-Engineered" to fit nearly every make of filter—and to fit the job your vehicles must do.

If you're operating any engines that are not filter equipped, look over the AC Oil Filters "Job-Engineered" for crankcase capacities up to 40 quarts. They not only "Dirt-Proof" engine oil, but their husky construction assures very long life.

AC
OIL FILTERS

AC SPARK PLUG DIVISION •

GENERAL MOTORS CORPORATION

COMMERCIAL CAR JOURNAL, April, 1949

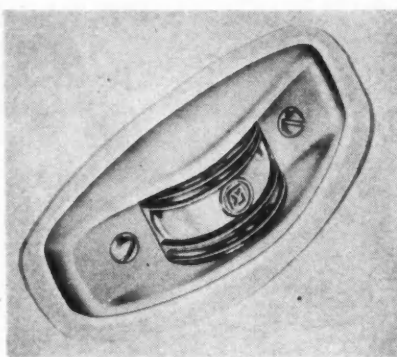
203

New Products

Continued from Page 202

in addition to the former brass base units. Lamp is identical except new steel base unit is considerably lower in cost. Patented lens clips hold screws and the lens in the housing when the bulb is replaced.

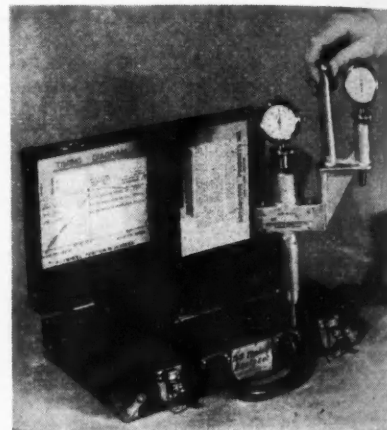
Other items added to the K-D line include combination stop and rear lights in economy black door models.



These units have universal brackets welded on the back for adjustment to various bolt centers. Triflex glass reflecting lenses are used, and bodies are finished in black enamel. K-D Lamp Div., Noma Electric Corp., Cincinnati, Ohio.

P230. Timing Analyzer

Checking and adjusting injector timing on Cummins Diesel Engines is both simplified and speeded up with the use of a new timing analyzer. This instrument is designed for use in checking, timing and setting injector push rod travel on Cummins diesel engines. Uniform setting of all cylinders is said to be assured. With this instrument it is possible to check valve timing, broken or worn lower rocker



shafts, as well as broken or worn lower rollers and pins.

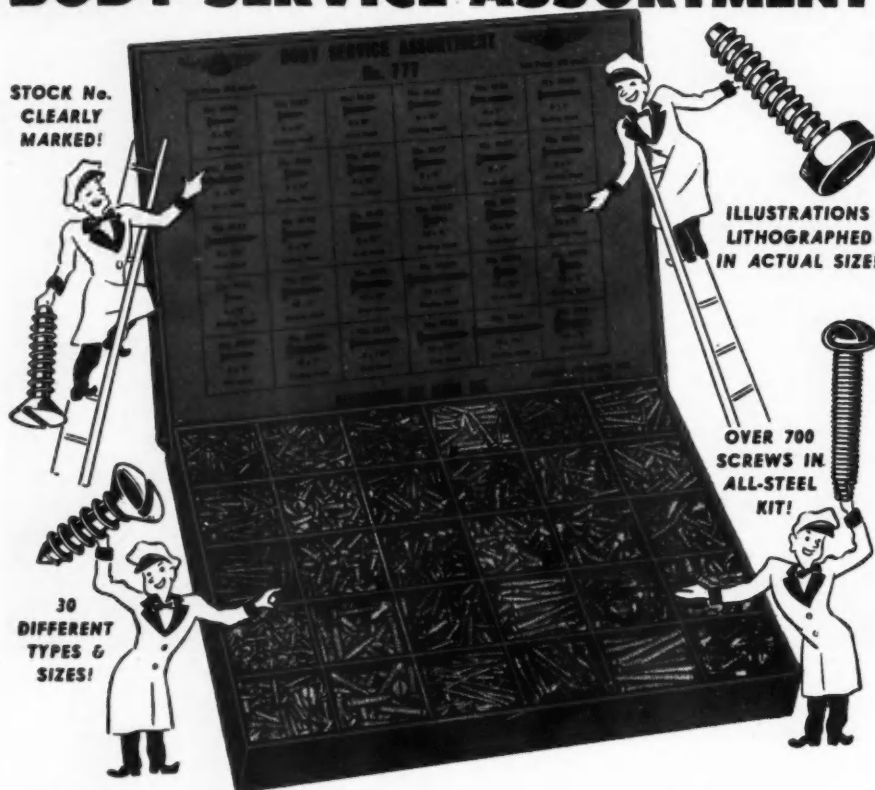
In addition, distorted lower rocker levers caused by a run-away engine, stuck valves, or excessive engine speed while descending grades may be located. In use, the analyzer replaces the fuel injector and the engine is rotated by hand. Automotive Products, Inc., Portland, Ore.

P231. Battery Vitalizer

A portable device called the vitalizer maintains automobile battery efficiency during cold weather for fast starting. Chemical activity within the battery is kept at summertime efficiency, no matter how low the temperature. Batteries, which ordinarily lose as much as 50 per cent of their capacity during extremely cold weather, are thereby kept fully energized, the manufacturer states.

Equipped with a hook for hanging it from the steering wheel, the Vi- (TURN TO PAGE 206, PLEASE)

DORMAN No. 777 BODY SERVICE ASSORTMENT



THE DORMAN BODY SERVICE ASSORTMENT No. 777 is a complete assortment of sheet metal screws designed to meet the needs of auto body shops, large garages and fleet maintenance repair shops. This kit contains over 700 sheet metal screws of 30 different types and sizes. The container is made of heavy steel with each size and type of screw in individual sections. A diagram showing the position, stock number, exact dimensions and type of head is in clear view when the assortment is open. All illustrations on this diagram are reproduced in life size so anyone can quickly determine the exact size and number of any popular sheet metal screw. For your convenience, refills for this Assortment are now available in handy Dorman Ready-Paks.



DORMAN PRODUCTS Inc.
CINCINNATI, OHIO

"The Best we've ever used..."

WORLD BESTOS brake blocks



"Especially on Mountain Grades"



◆ Cities Fuel Corporation of Fresno, California operates a fleet of 21 heavy-duty units over the widely varying road conditions of West Coast streets and highways. To solve its lining problems, this progressive operator has swung to World Bestos Brake Blocks.

"These blocks are the best we've ever used," says Mr. Kenneth C. Farrell, Traffic Manager of Cities Fuel Corporation. "Their performance is especially outstanding on mountain grades. Since adopting World Bestos materials, we've found we get positive braking under all conditions. Our savings on service and replacements are certainly positive, too!"

Truckers everywhere are getting such results with World Bestos Brake Blocks. Of an extremely tough fibrous mix made to withstand high temperatures usually disastrous to ordinary linings, these blocks wear slowly in even the most severe service. Easy on drums, they provide a stable, resilient friction under all operating heats and pressures. And they are available in tested formulations designed to meet every operating demand.

For proof, reline with a set of World Bestos Brake Blocks and compare them to those you now use.

BRAKE LININGS BRAKE BLOCKS



WORLD BESTOS CORP.

NEW CASTLE, INDIANA

7352

New Products

Continued from Page 204

talizer comes with two leads, one of which plugs into the dashboard cigar lighter receptacle and the other which can be connected to any 110-volt, 60-cycle, ac outlet. General Electric Co., Schenectady, N. Y.

P232. Hose Reel

A new air-actuated hose reel for tire inflation, chassis and gear lubri-

cation, and water service makes use of Rol-O-Matic clutch, which retracts the hose from any point and permits the operator to unwind the hose without effort from any point.

The Rol-O-Matic clutch eliminates spring tension, ratchets and complicated controls that create back pull, tugging at hose or unnecessary walking back and forth to operate the reel. Single reels or batteries of three, four or five reels for ceiling, wall or floor-mounting now are available. The U. S. Air Compressor Co., Cleveland, Ohio.

Body Illustrated: Model RB-70, standard 7 cu. yd. rock body, specially constructed for quarry and rock work. Made in all capacities. Mounted over standard double-lift arm type under body hoist or telescopic hoist, depending on capacity and use.



Keep ahead of schedule with "On The Job" Design

In Marion Bodies and Hoists you get dependable loading, hauling and dumping performance that keeps you "loads ahead." With "On The Job" design you get sturdy construction features developed by Marion engineers in the field under actual operating conditions.

Ask your Marion Distributor about the Marion unit designed "on the job" to meet your special requirements, or write direct.

MARION
DUMP BODIES and
HYDRAULIC HOISTS

GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION METAL PRODUCTS CO., MARION, OHIO



P233. Air Conditioner



The utility air conditioner for use with medium production spray guns, Black Arrow Model N9600, handles 35 cu ft per min at 80 lb pressure. It is made of rustless materials. No die-cast parts or through bolts are used. There are no moving parts, and no parts that take replacement. The cylinder tube is

cold impact, extruded aluminum capable of withstanding 1000 lb per sq in. Filtering element is of brass, and regulator body is forged brass with a stainless steel air valve assembly. Regulator cap is equipped with a stainless steel insert to eliminate freezing of the pressure regulating key. The Black Mfg. Co., Baltimore, Md.

P234. Offset Ratchet

An offset ratchet screwdriver designed to permit the application of leverage to drive screws, and to reach into areas inaccessible to common screwdrivers. The ratchet permits use of this tool in confined spaces and the reversing lever makes the tool suitable to drive or remove screws. The screwdriver has two blades, one for large and one for small screws. It has a ball end grip to prevent injury to hand. Overall length is 3 7/8 in. The Aero Tool Co., Los Angeles, Cal.

P235. Portable Cutter

The Nibblax is a new, maneuverable sheet metal cutting tool capable of making circular cuts with radii as small as 1 in. It cuts sheet metal up to 20 gage without bending, burring or stretching of metal. Especially handy for a smooth, quick job on corrugated sheet or pipe, or plastic sheet. It is easily attached in the chuck of any 1/4-in. motor in the same manner as a drill. Nord International Corp., New York, N. Y.

END

(Please resume your reading on P. 57)

RIGHT Load Booster unit with driving axle in rear, "dead" axle forward

"Load Booster" Third Axle Unit

A NEW TYPE of third axle called the "Load-Booster" has been added to the line of Detroit Automotive Products Corp. This unit consists of a heavy-duty load carrying axle connected to the rear drive axle through a rear spring assembly which is pivotally attached to the frame channels. The driving axle of the new Load Booster is at the rear of the dead axle, providing increased traction in starting and also more accessibility for checking and servicing.

When the truck starts, a greater proportion of the weight on the rear axles is automatically shifted to the rear driving axle, giving the truck increased traction for quicker starts. When the truck gets under way, the weight on the rear axles is again evenly divided by the Load-Booster double walking beam rear spring assembly.

Springs are pivoted to the frame at one point, midway between the axles, and because of this the truck frame lifts only half as high as the axle when passing over obstructions. Thus the load is protected from shock and tipping, better load flotation is produced, side sway is eliminated and a smoother ride is said to be obtained. The NoSpin differential is available as extra equipment to insure full traction of rear drive axle at all times.

(See also next page)

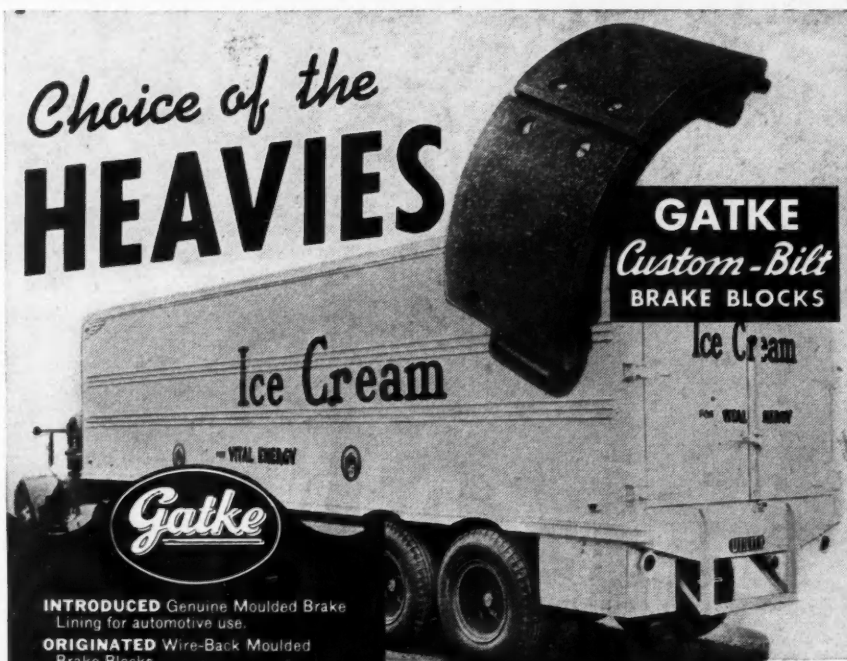
Cute Package!

The over-the-road transport truck driver had run out of hours, so he decided to board the bus and ride downtown to see a movie. When the bus pulled to the stop to pick him up, a beautiful but delicate young lady alighted. The package she carried seemed unusually large for so fragile a creature. Gallantly he waved the bus on its way and offered to carry the package saying, "Really, I don't see how you can manage such a load like this all alone." "Oh, I never do," she answered. "There's always some dope standing around that helps me."



Choice of the HEAVIES

GATKE
Custom-Bilt
BRAKE BLOCKS



INTRODUCED Genuine Moulded Brake Lining for automotive use.

ORIGINATED Wire-Back Moulded Brake Blocks.

DEVELOPED the first patentable Automotive Brake Lining.

PIONEERED CUSTOM-BILT Brake Lining Sets.

LED the development of Brake Blocks for Trucks, Trailers and Buses.

CHAMPIONED correct balance between liners for primary and secondary shoes as essential to maximum efficiency.

INITIATED oversize brake lining to compensate for drum wear.

PERFECTED the Simplified Brake Survey System for Fleet Operators.

INITIATED Standard Quality at low cost in the Standard Brake Lining Program.

INSTITUTED Comprehensive Labeling of Brake Lining Sets.

PROMOTED Simplified Brake Lining Catalogs.

INVENTED Grooved DURA-BLOK Brake Lining.

POPULARIZED TELL-ALL Labels for Boxed Brake Lining Sets.

Smooth non-grabbing action—that adds countless miles to tire life and reduces strain on drivers.

Extra Power for emergency stops—dependably maintained at all service temperatures.

Tremendous wear life—for longer service with fewer adjustments and reduced upkeep cost.

These are a few of many advantages that make GATKE Custom-Bilt Brake Blocks and Liners first choice of Fleet Operators from Coast-to-Coast.

Try this test! Use GATKE Brake Blocks for your next five relines and compare results.

Ask your GATKE Jobber or write.

Gatke
CUSTOM-BILT

BRAKE LININGS

BLOCKS SETS ROLLS SHEETS

GATKE CORPORATION

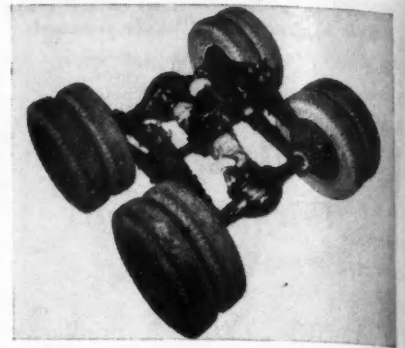
248 N. La Salle St., Chicago 1, Ill.

THORNTON

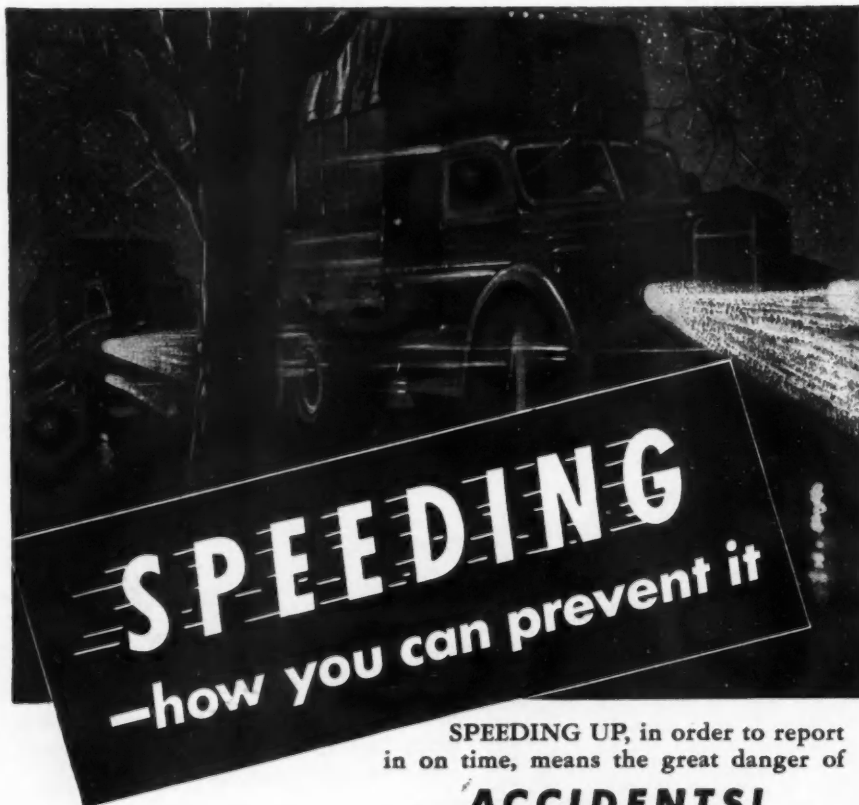
Makes Improvements in Tandem Drive

IMPROVEMENTS in the 1949 Thornton Drives feature better gearing, more rugged bearings and a drastic simplification of the assembly.

New models have a ratio in low of 2.04 or 1.65, and 1.18 or 1.0 in high. Heavy-duty roller bearings are now used in the top shaft front bearings, providing 20 per cent increased capacity. Roller bearings are used in



The improved Thornton drive



SPEEDING UP, in order to report in on time, means the great danger of

ACCIDENTS!

But the *Servis Recorder* on a truck prevents that incentive to "step on it."

YOUR trucks will do less speeding when your drivers realize they can't "make up" lost time by "giving her the gas" and getting in on time. They know all delays will show up on the chart. That's how the *Servis Recorder* on a truck helps to prevent speeding—and accidents. It takes away the motive for speeding. That's why so many insurance companies recommend equipping fleets with *Servis Recorders*.

The whole story is told in our helpful Bulletin: "How to Prevent Trucks from Speeding and Having Accidents." It's free. Send for it today. The Service Recorder Co., 1375 Euclid Ave., Cleveland 15, O.

"Making Up" Wasted Time
Causes Most Speeding
and Speeding Causes
Most Accidents.



The Servis Recorder

Helps Prevent Speeding and Accidents

the intermediate shaft front bearing in place of the former ball bearings to up capacity as much as 20 per cent. Top shaft bushings are now made of Oilite, while the differential bearing retainer is of Pearlite malleable. The U-joint retainer pin is now a ball and nut type in place of the former pin and snap ring assembly, and the ball housing is now made of chrome steel, 5/16-in. in thickness as opposed to the former 3/16-in. housing.

Support braces are attached with stud and castle nut. With the new model, axles can be removed without disturbing the gear case. Flange type torque stabilizers are now used, and an Oilite seat is provided for axle oil seal. Rubber bushings are used in the shackles, and a spring hanger dust seal has been added for longer life of these parts. In all, 132 parts have been eliminated with the new assembly. There are now only ten lubrication points on the entire bogie.

Hang the Evidence

A judge, failing of re-election, was made cashier of the local bank. The Safety Director for a tank fleet operator presented a check to be cashed.

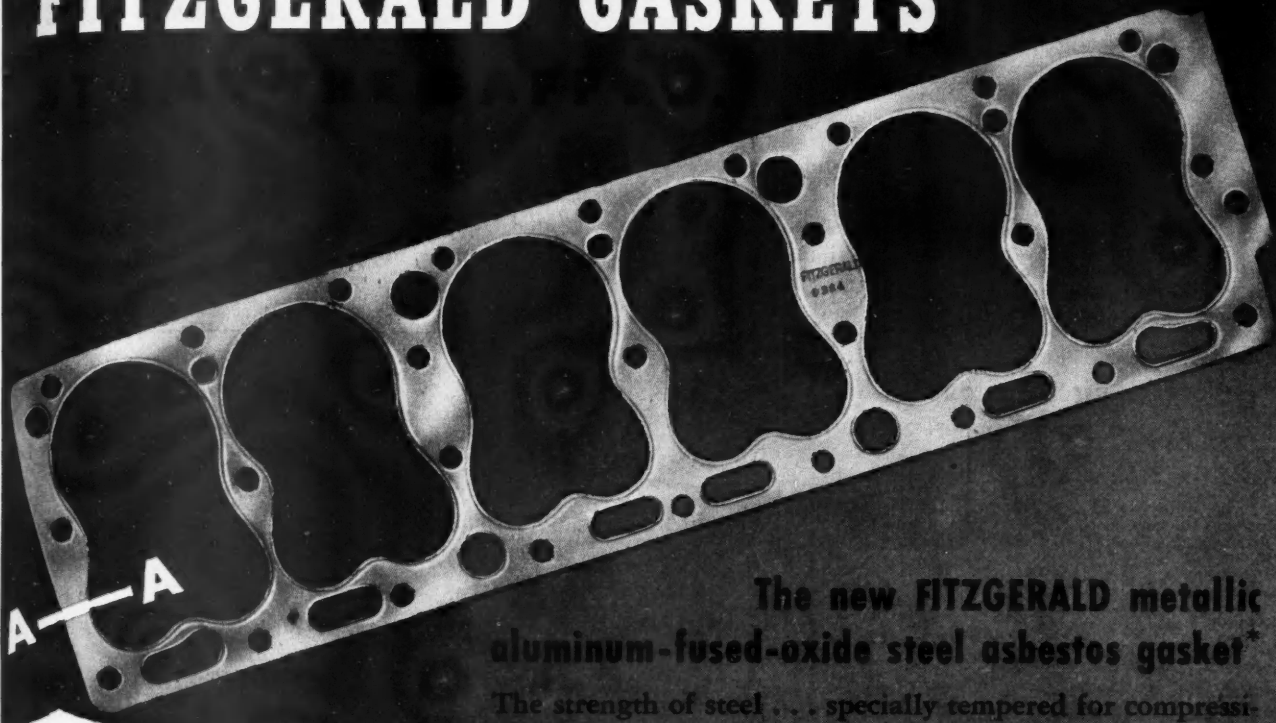
"Don't know you," greeted the new cashier. The safety official produced a Wall Street credit card, a business card, and a lot of letters addressed to himself.

"Not sufficient proof of identity," said the cashier, pushing the check back.

"Why, Judge," protested the safety man, "I've known you to hang a man on less evidence than that."

"That may be," said the erstwhile Judge, "but when you're paying out money you have to be unusually careful."

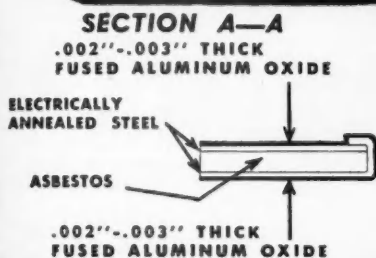
FITZGERALD GASKETS



The new FITZGERALD metallic aluminum-fused-oxide steel asbestos gasket*

The strength of steel . . . specially tempered for compressibility and resiliency . . . is combined with aluminum's resistance to rust and corrosion in this new line of Fitzgerald gaskets which withstand highest compression tests where others fail. There's a Fitzgerald gasket for every engine. The Fitzgerald Manufacturing Company, Torrington, Conn.

U. S. Pat. Off.

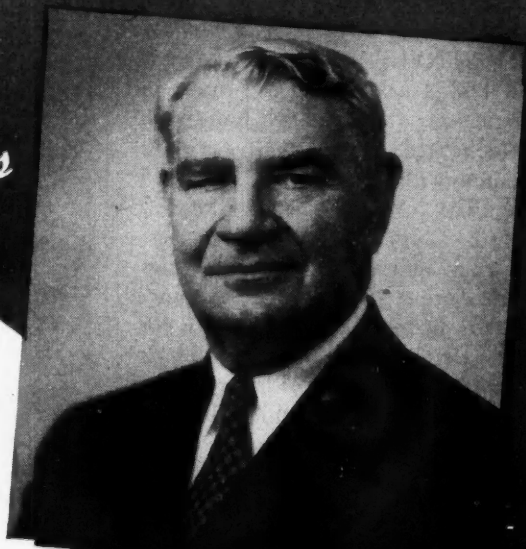


Gasket craftsmen for 43 years

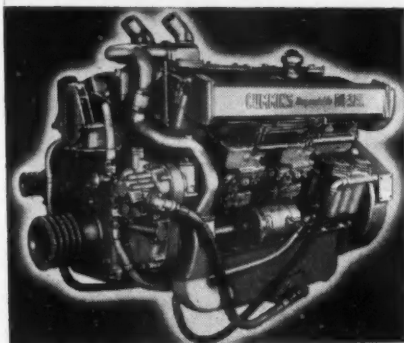
Says P. J. Fitzgerald . . .

Our metallic aluminum-fused-oxide steel asbestos gaskets have been tried and proven for many months. Therefore, I can say to you with all sincerity that we have never made a better gasket. We have kept pace with the industry for forty-three years and feel safe in saying to our customers that when better gaskets are made you can depend on Fitzgerald to make them.

P. J. Fitzgerald
P. J. Fitzgerald President



FITZGERALD
Gaskets
SINCE 1906



Front and left side view of new Cummins V-12 engine showing location of new fuel pumps at front below manifold

CONDENSED SPECIFICATIONS

	NVHS-1200	NVH-1200
Type	40 deg V	40 deg V
Bore and Stroke	5 1/4 x 6	5 1/4 x 6
Number of Cylinders	12	12
Piston Displacement (Cu. In.)	1486	1486
Horsepower (Maximum)	550	400
RPM (Maximum)	2100	2100
Cycle	4	4
Compression Ratio	13.5:1	15.5:1
Length	73	73
Width	41	41
Height	57	57
Net Weight (Lb.)		
(with standard accessories)	4550	4300
Weight per Horsepower (Lb.)	8.3	10.8

TWO NEW DIESEL ENGINES for automotive applications have been announced by the Cummins Diesel Engine Co., Columbus, Ind. These models are designated as the NVH series (NVH-1200 and the supercharged NVHS-1200) and the HRBS-600.

Model NVHS is said to be the most powerful truck-type diesel now in production. It is a 12-cyl, four-cycle, supercharged V-type engine with a maximum rating of 550 hp at 2100 rpm. The NVH-1200 is rated at 400 hp at 2100 rpm.

The cylinders of the NVH series engines are cast en bloc with removable wet liners. They are set at a 40-deg angle to provide a compact block that will fit the frames of large trucks. An unusual feature of this Cummins V design is that the cylinders are staggered—the right bank being slightly ahead of the left bank. The principal advantage claimed for this design is that it eliminates the use of special and costly forked or articulated con-rods.

The cylinder heads are of aluminum, one casting for each three cylinders.

The conventional con-rods are mounted side by side on the crank pins of a conventional six-throw, dynamically balanced and counter-

weighted crankshaft. All journals and pins of the crankshaft are Tocco hardened. A viscous friction damper is available to control torsional vibration, and allow a wide speed range for special applications.

Full-force feed lubrication is delivered by a gear pump through a filter and waterjacketed oil cooler.

The pistons, of heat-treated aluminum, incorporate the "sneezers" design and all of the recent Cummins



Flashing

DIRECTIONAL SIGNAL SWITCH



KD 714
Flashing

KD A541 Armored Clearance Lite.



Brass or steel base. Single unit assembly popular with mechanics. Tough casting protects bulb and lens.

Audible clicking when in operation. Indicator light. Finger tip control. Adjustable handle. Three-wire-circuit simplifies installation. Universal mounting. Sold separately or with Directional Signal Kits.

KD 333 Stimsonite Triflex Reflector.



Miracle of light reflection. Appears like lighted tail lamp at distances of 500 to 700 feet.

KD 9458 Double Faced



Heavy duotone plastic arrow-lens . . . uniform bright amber when lighted . . . opalescent unlighted. Positive signal 100 feet day or night.

KD C891 De Luxe Junior Fog Lite.



Glass Sealed Beam 4 3/4" bulb. Amber or clear. Brass body. Chrome finish.

KD 254 Jumbo Stop Lite.



Stainless Steel Door. Black enamel finish. 7" lens with refracted letters. Red or Amber. Flush or bracket mounting. 32 C. P. bulb.

KD 539 Clearance Lite.



Flat surface mounting. Aluminum or Chromium Finish. Amber, Clear, Green or Red Lens. 3 3/4" diameter. 1 1/2" deep.

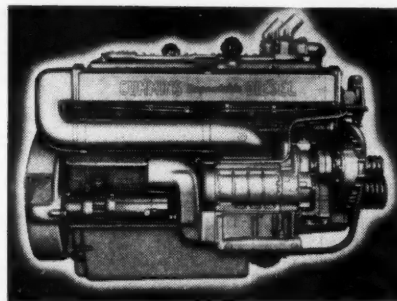
V-12 High-Speed Diesel

combustion research developments. In addition, the piston skirts have a knurled surface, of diamond pattern, which is said to provide better lubrication and cooling (because of the oil retained in the grooves of the knurl-

ing), and to make the pistons highly resistant to scuffing and seizure.

The piston rings are of keystone section, and the top ring is chrome plated.

Valves (two each for intake and



Right side view of the NVHS-1200 showing location of Roots supercharger

exhaust) and injectors are located in the cylinder head, actuated through rocker arms from twin camshafts. Stellite inserts are used on the exhaust valve seats. In the gear train driving the camshafts, provision is made for driving the water pump, lube pump, fuel pump and other accessories.

New Design Fuel Pumps

THESE new engines are equipped with a completely new Cummins fuel pump. A single plunger measures the fuel charge for all cylinders, assuring that each injector receives the proper predetermined amount of fuel at any required engine speed and load within the approved ratings. The fuel is delivered to the injectors at low pressure through a rotating distributor disk arrangement.

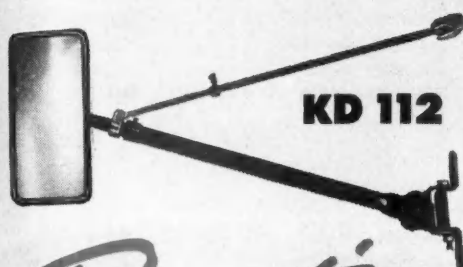
The new pump contains a double disk arrangement from which it gets its name, the "DD" pump. One disk allows fuel to pass into the metering pump, while the other performs the distributing function only.

Two of these new fuel pumps are used on the NVH series; each serves six cylinders. They are driven together but timed individually to the two banks of cylinders.

Fuel speed is controlled manually, but the idle speed is maintained by a low-speed governor and the maximum speed range by a high-speed governor. The engine is further protected by an overspeed trip, and by the built-in characteristics of the fuel pump which limits the speed in the event of line failure.

The electrical equipment includes a 32-volt (350, 750 or 1500 watt) generator, 32-volt starting motor, voltage regulator and push-button starting switch.

Condensed specifications for the NVHS-1200 and the NVH-1200 will (TURN TO NEXT PAGE, PLEASE)



KD 112

Presenting

RECTANGULAR TRUCK MIRROR with Brace

KD 112 combines **KD 111**, **KD 102** Mirror Arm Brace and **KD 108** Bracket. Panel or hinge mounting. *Adjustable hinge bracket . . . extension 15" to 27".* Designed to take hard knocks and give lasting service.

KD 111 . . . 4 1/4" x 8". Silver plated surface sealed from weathering. Ribbed for strength. Off-center mounting assures vertical position and minimum vibration. Inner re-enforcement plate prevents wear.



KD 910 Sealed Beam Headlite.

Horizontal or vertical mounting. Stainless steel door. Heavy Duty unit. 6 or 12 volt. With or without parking lite.



KD 204 Stop and Rear Lite.

Triflex Reflecting Lens. Chrome door or economy black door. Universal mounting.



KD 205 Stop and Rear Lite.

Triflex Reflecting Lens. Chrome door or economy black door. Attached license plate bracket.



KD C890 De Luxe Fog Lite.

5 1/2" Sealed Beam bulb. Adjustable head. Gravel shield or bumper bar mounting. Clear or amber. Chrome plated.



K-D LAMP DIVISION

NOMA ELECTRIC CORPORATION

1910 ELM STREET • CINCINNATI 10, OHIO

New Cummins High-Speed Diesels

Continued from Page 213

be found in a table at the beginning of this article.

From the maintenance angle, it is interesting to note that, inasmuch as so many of the parts used in the new V-12 engines are identical to the other standard Cummins parts, maintenance

and adjustment procedures are the same. No new or special tools will be required. The factory service department claims that any mechanic, having worked on any of the previous models, can service these engines without any additional service information, except on cylinder timing.

In addition to being proved and tested in the Cummins laboratories, the new NVH series have been field-tested for as much as two years in heavy-duty, off-road trucks, a 5-yard shovel, and 65-ton locomotives.

Model HRBS-600

THE other new Cummins diesel engine has been designed to meet demands for horsepower capacities not previously covered by the standard Cummins line. The 6-cyl. Model HRBS-600 develops 225 hp at 1800 rpm.

This engine has a 5½-in. bore and a 6-in. stroke, with a 743 cu in. piston displacement. Other mechanical features include two valve heads each for intake and exhaust, continuous groove main bearings, increased flow lubricating system, buttress-type oil pan and flywheel housing, a newly designed lubricating oil cooler of the water jacket type, and a Roots blower.

NEW HEAVY-DUTY OIL

A new motor oil, now available, has been announced by Socony-Vacuum Oil Co., Inc. The new heavy-duty Mobiloil, according to the company, has exceptional oxidation resistance and chemical stability, powerful detergent action and a high viscosity index, assuring optimum viscosity at all operating temperatures.

The new Mobiloil is stated by its manufacturer to be compounded entirely of high-grade, solvent-extracted base oils and extremely efficient additives. The result is a heavy-duty lubricant of greatly improved performance, Socony-Vacuum says. The oil is the result of a three-year program of research and proving that involved countless laboratory pilot and full-scale tests and thousands of miles of road testing in many makes of engines, under all conceivable driving conditions.

Perfect Score!

One hundred men—truck drivers, mechanics and clerks—and two women stenographers were employed at a relay station operated by a large trucking concern. The owner told the manager: "Make your reports brief and snappy. Don't waste words, we are too busy at the home office to analyze voluminous reports. Give precise figures. Time is money. Remember this."

The manager's next monthly report read: "Last month two per cent of the men married 100 per cent of the women."



"Tiny", here, is our personification of another of the Palm Brothers all-star team...low-cost, high-quality truck decals. "Tiny" is a small eater of profits... but when it comes to quality, he's right on top!



As a user of mobile advertising on your trucks, you'll be interested in learning "What Decals Can Do For You". Write for this informative, illustrated booklet today! We'll include, as long as they last, our popular new folder, "A Moving Story For Truck Owners". Then get set for spring spruce-up...order your truck decals now! Address your request to Dept. 914.

COPYRIGHT 1949 THE PALM BROTHERS DECALCOMANIA COMPANY

THE PALM BROTHERS DECALCOMANIA COMPANY

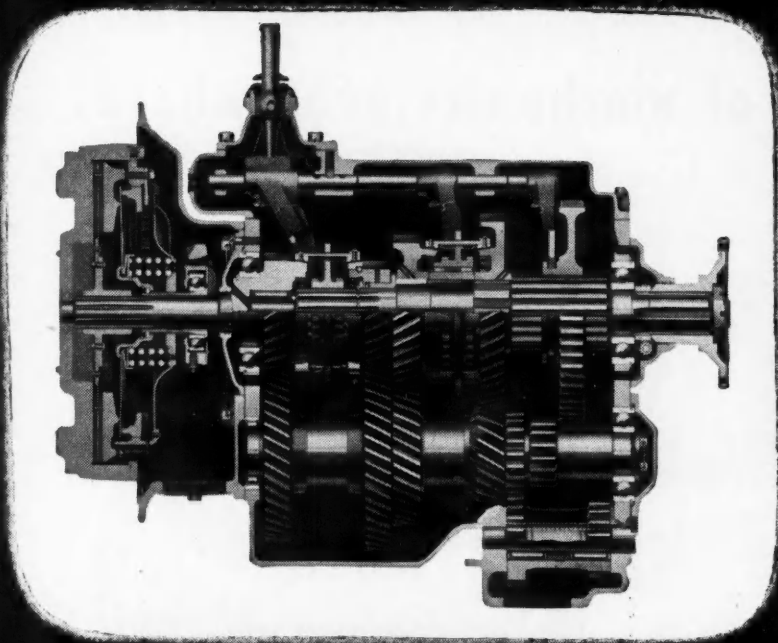
3736 REGENT AVE., CINCINNATI 12, OHIO

OFFICES IN ALL PRINCIPAL CITIES • SEE YOUR 'PHONE BOOK



The Purpose of the Spicer Synchronized Transmission

The Spicer Synchronized Transmission is a perfected gear mechanism that works hand in hand with the human ingenuity of the truck driver. Together, they assure an easier job for both: each making the other more efficient, assuring more productive horsepower put into the wheels and more ton-miles handled each day.



The Advantages of the Spicer Synchronized Transmission

Faster Shifts



No Missed Shifts



Fast Getaway



Less Vehicle Slowdown when Shifting



Down Shifts Made

Without Slowdown for Double-Clutching



No Lugging of

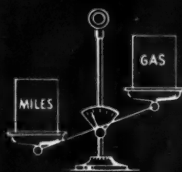
Engine



Shifting Lever Travels Same Distance Every Shift



Savings in Fuel



Lower Vehicle Upkeep



Spicer engineers will help your vehicles move more tons at less cost per mile, by adapting the Spicer Synchronized Transmission to your individual needs.

SPICER MANUFACTURING
Division of Dana Corporation
TOLEDO 1, OHIO



TRANSMISSIONS • PASSENGER CAR AXLES
CLUTCHES • PARISH FRAMES • STAMPINGS
TORQUE CONVERTERS • UNIVERSAL JOINTS
SPICER "BROWN-LIFE" GEAR BOXES
RAILWAY GENERATOR DRIVES

Kester Solder 1st choice of mechanics everywhere...



Standard for the Trade since 1899

Kester products have been in constant demand by mechanics for over half a century.

**POSITIVE
FLUX
UNIFORMITY**

Kester Acid-Core Solder
Kester Plastic Rosin-Core Solder
Kester Radiator Solder (Flux-Core)
Kester Solid Wire and Bar Solder
Kester Soldering Salts
Kester Soldering Paste
Kester Soldering Accessories

**LABORATORY
CONTROLLED**

Insist upon Kester from your jobber!

The tin-lead content of Kester Solder was established many years ago by you, the trade, as the alloy that would give the best results. Do not accept substitutes.

KESTER SOLDER COMPANY

4201 Wrightwood Avenue, Chicago 39, Illinois

Factories Also at

Newark, New Jersey • Brantford, Canada



**KESTER
SOLDER**

Tires, Batteries, Ignition Top Breakdown List

OLD MAN WINTER, absent-mindedness and housing developments were factors in a record-breaking number of automobile breakdowns in 1948 when a total of 40,566,000 trouble calls were handled by the nation's garages, the American Automobile Association reported recently. This was an increase of approximately 9 per cent over the 37,260,000 breakdowns estimated for 1947.

"In addition to the fact that there are a large number of ancient vehicles on the road," the A.A.A. said, "unusually severe weather conditions during the early months of last year resulted in a number of calls for help. On 1,349,000 occasions last year, forgetful motorists ran out of gasoline before they could get to the filling station. One of the most startling increases last year was the jump of 47 per cent in the number of motorists getting stuck in the snow, mud or sand. Of the 2,257,000 motorists who got stuck, quite a substantial proportion were those who had moved into new homes in localities with streets as yet unpaved and got mired in after the first big rainfall."

The A.A.A.'s annual estimates of motorists' mechanical woes are based on reports from 16,000 service stations, in the U. S. and Canada, under contract to render emergency aid to motor club members.

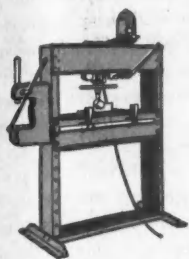
AUTOMOBILE BREAKDOWNS (Based on reports from A.A.A.)

TYPE OF SERVICE	NUMBER OF BREAKDOWNS		PERCENTAGE CHANGE
	1948	1947	
Tire	8,660,000	8,864,000	-2.3
Battery	8,012,000	7,098,000	12.9
Tow	4,920,000	5,145,000	-4.4
Ignition	4,389,000	4,095,000	7.2
Carburetor ..	3,323,000	2,508,000	32.5
Wrecker	2,302,000	2,031,000	13.3
Stuck	2,257,000	1,535,000	47.0
Out of gas..	1,349,000	1,051,000	28.4
Lock & Key..	677,000	473,000	43.1
Starter	640,000	831,000	-23.0
Gas Line ...	474,000	425,000	11.5
Lights	438,000	317,000	38.2
Brakes	426,000	507,000	-16.0
All Others..	2,699,000	2,380,000	13.4
TOTAL	40,566,000	37,260,000	8.9

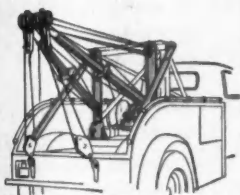
All in the Point of View

Parts Manufacturer: "Young man, I'm afraid you won't do. You work hard, but after a month I notice you haven't brought in an order. You just can't sell!"

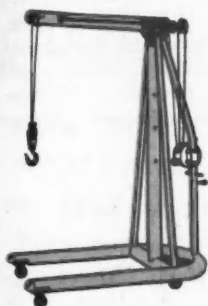
New Salesman: "I'm selling; I'm selling all the time. The trouble is that folks just aren't buying."



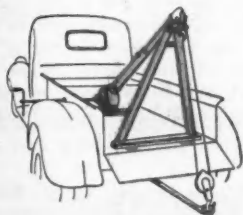
HYDRAULIC PRESSES



WRECKING CRANES (8-Ton)



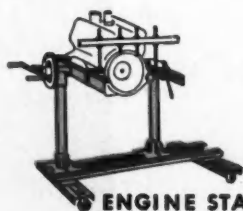
FLOOR CRANES



WRECKING CRANES (3-Ton)



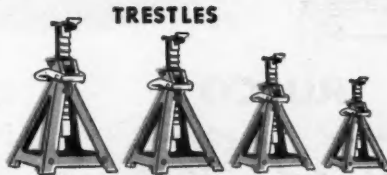
CHAIN HOIST
TRESTLES



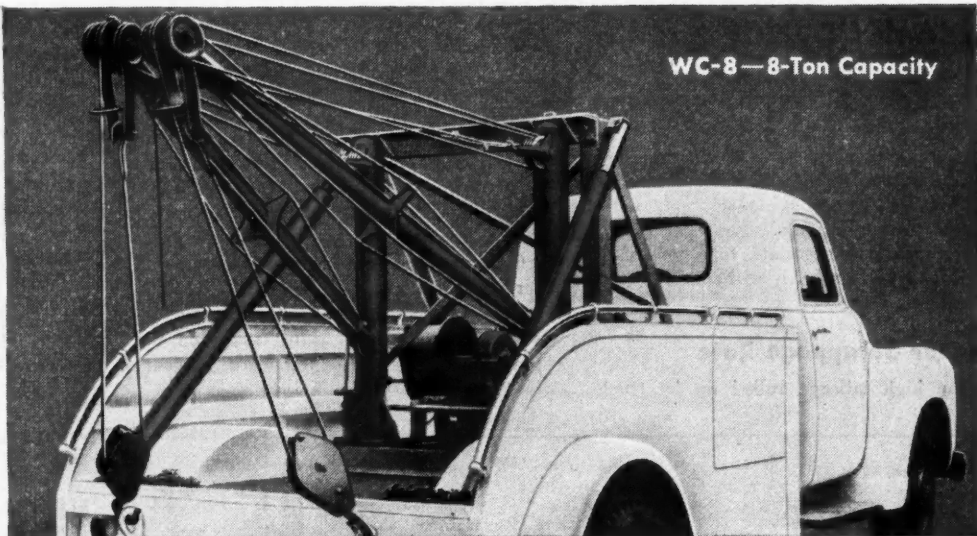
ENGINE STANDS



JACKS



TRESTLES



WC-8—8-Ton Capacity

MANLEY WRECKING CRANES

● There are four of them—each a winner in its class. **WC-8—8-Ton Capacity:** Double booms operate individually or as a unit from power take-off. Automatic drag brake when reeling—special drag brake when hauling. Controls at side or in rear. Out-riggers available as an accessory. Large frame welded into complete unit, independent of truck chassis. **WC-4—4-Ton Capacity:** Same construction as WC-8 except single instead of double boom. A high quality wrecker, suitable for city and quick pick-up work when mounted on light truck. **WC-3—3-Ton Capacity:** Compact. Mounts on any open truck. Folds out of the way. Weighs only 320 pounds. Hand-operated, 100 to 1 reduction. **WCJ-3**—Same as WC-3 with slight change in dimensions to fit Jeep body. ● Like all Manley Automotive Service Equipment, these Wrecking Cranes are sold only through Automotive Jobbers.

● Shown here are a few of the many minute-and-muscle-saving items offered by Manley. Investment in good Manley Equipment pays off—over and over again.

ACCO

York, Pa. • Chicago • New York • Portland • San Francisco • Bridgeport, Conn.

**MANLEY DIVISION
AMERICAN CHAIN & CABLE**

Manley Equipment Saves Man Hours

**MANLEY
Automotive Service
EQUIPMENT**



Detroit Dispatch

Continued from Page 6

that production will be in the neighborhood of one million units, which is substantially behind last year, but considerably ahead of the prewar average. Nonetheless, buyers are able to negotiate very good deals right now and probably will continue to do so all this year.

Higher Scrappage Rate

The high mileage rolled up by trucks

during the war years and in the postwar period when replacements were hard to get is beginning to have an effect on truck scrappage. R. L. Polk & Co., Detroit statistical agency, reports that about 60,000 more trucks were retired in 1948 than in a normal prewar year. Last year, 307,867 trucks went off the road, compared with a 24-year average of 249,602. Another factor involved, is that for the past year trucks in most sizes have been available for replacement, often at attractive discounts to fleet users. Polk recently revealed that average age of trucks on the road is 8.0 years, compared with 5.6 years in 1941, and 8.7 years in 1946.

OVER 30,000,000

RUSCO
Fused Fabric
**CLUTCH FACINGS USED
 AS REPLACEMENT AND
 ORIGINAL EQUIPMENT**

Recognized as an outstanding development in the friction materials field, Rusco Fused Fabric Clutch Facings are available in a complete line. For sleek sedan or giant cargo truck . . . the finest facings made bear the name *Fused Fabric*.

THE RUSSELL MANUFACTURING COMPANY, MIDDLETOWN, CONN.

24-Volt Prospect Brighter

There is some evidence that the truck manufacturers are weakening a bit in their opposition to the demands of the armed services that all new military vehicles shall have 24-volt electrical systems. Opposition has been based chiefly that facilities for providing such equipment are not available. Ordnance says it must be provided for cold weather starting and for operation of auxiliary equipment. Manufacturers at present see no commercial adaptation for truck use, but one engineer concedes that if 24-volt becomes common on military vehicles, there might be some possibilities in it for specialized trucks carrying high voltage auxiliary equipment.

SLOWER VALVES ON DIESELS

One of the larger diesel engine manufacturers may have stumbled onto an important development for reducing smoke troubles with the diesel engine. The company has been running tests on engines with special camshafts to provide slower opening of valves to determine the effect on power. Early results indicate that not only is more power developed, but surprisingly enough a much cleaner exhaust results. It is still too early to draw any definite conclusions, but the indications at least are promising.

END

(Please resume your reading on P. 10)

One Man's Opinion

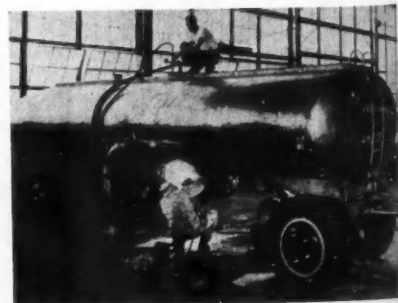
The long distance van driver was halted by engine failure in a typical South Georgia town. He was pacing impatiently up and down alongside his vehicle awaiting the arrival of the road service truck when one of the townsmen sauntered up and started a conversation: "Whut do y'all think of our little town, mister?"

Driver: "It certainly is unique."

Native: "Whut do ye mean by 'you-neek'?"

Driver: "It's from the Latin 'Unus' meaning one, and 'equus' meaning horse."

Free Ride



This frameless, 4400-gal semi-trailer tank will give 200 gal of gasoline a free ride on every trip, thanks to U.S.S. Cor-Ten in the body, a product of Boyle Mfg. Div., U. S. Steel Products Co., a subsidiary of U. S. Steel Corp. The high-strength, thinner sheets saved 1200 lb in weight

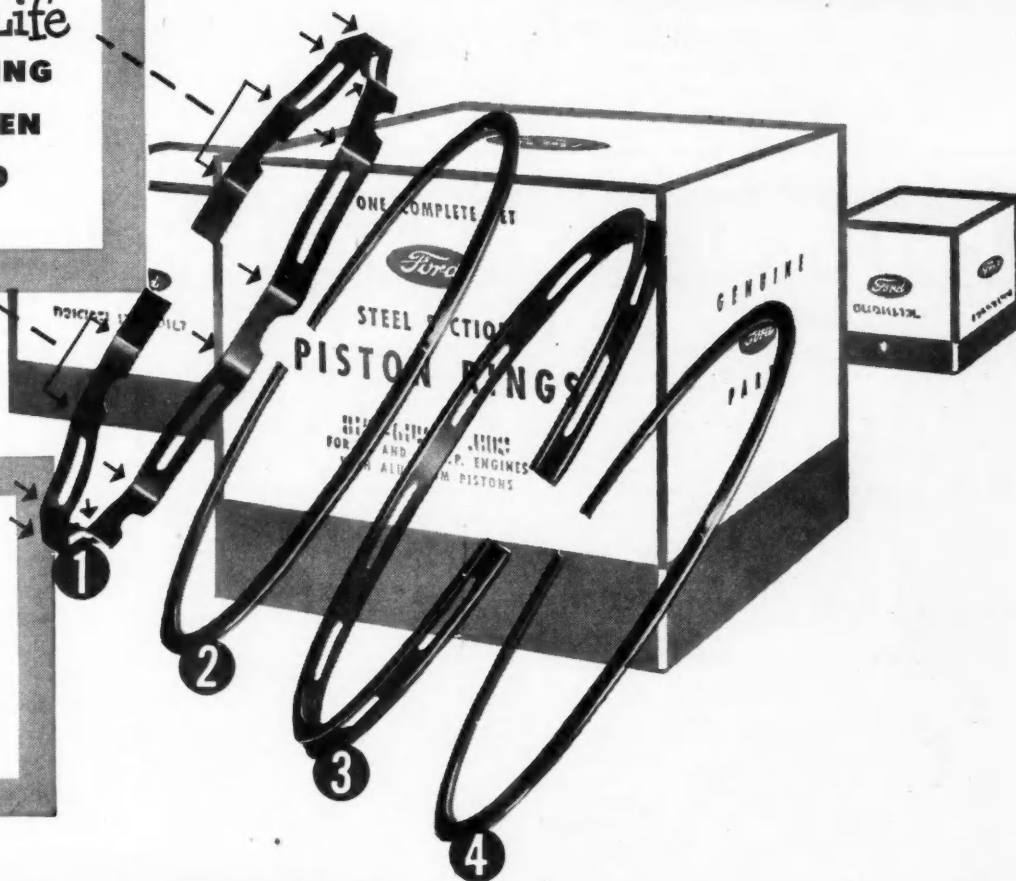
Always Use Genuine Ford Piston Rings

Save Time and Money

For Longer Life
14 STABILIZING
POINTS WHEN
INSTALLED

OIL RING

1. Inner Ring or Expander (a Ford Exclusive)
2. Steel Section
3. Cast Iron Oil Ring
4. Steel Section



Genuine Ford Steel Section Piston Rings

Exclusive . . . Patented . . . Made Right . . . Priced Right

Only cast iron ring section contacts cylinder wall during break-in period, eliminates scoring danger. After breaking in, steel ring sections absorb wearing forces. The inner ring has fourteen contact points which stabilize and control the ring and piston. Result—Genuine Ford Steel Section Piston Rings give reduced piston vibration . . . longer piston and ring life . . . better oil control . . . more power and economy.

Genuine FORD Parts . . .
Right for FORDS!

Genuine Ford Parts are made right to fit right and last longer—they are *right* for Fords. So naturally replacement jobs go faster when Genuine Ford Parts are used. When time is money, there's a real double saving in Genuine Ford Parts for Ford Car and Truck operators. See your nearest Ford Dealer for quick delivery.



F O R D M O T O R C O M P A N Y

THE FREEDOM TRAIN LOCAL



One of the two Freedom Train trailers ready for the road. Local truckers are responsible for picking up trailers at last point of exhibition

TWO TRAILERS CARRY DOCUMENTS TO SMALLER TOWNS AND TO LOCAL POINTS WITHIN METROPOLITAN AREAS

A new mobile Freedom Train "local" made up of two huge Strick aluminum semi-trailers has taken to the road following dedication cere-

monies at Reyburn Plaza in Philadelphia. It carries a collection of 65 facsimiles of the historic documents displayed aboard the original Freedom Train.

The trailers are being provided as a public service by Strick Co. of Philadelphia, manufacturers of aluminum trailers and truck bodies. Strick also has agreed to furnish four more such two-trailer caravans to permit carrying the documents to all parts of the country.

The trailers, connected when on exhibition to make one large unit, contain a public address system to furnish facilities for public speaking and musical background. The historic documents are framed in chromium panels and the caravan also contains two large American flags on pedestals—one with 13 stars and one with 48.

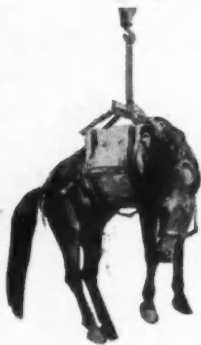
The interiors of the trailers are lined throughout. There is a blue-gray carpet on the floors and the walls are gray velvet with blue trimmings. Indirect fluorescent lighting is used as aboard the Freedom Train.

In the tri-state area of Delaware.

Put Your Money on the

Thermoid Line

Built for
Heavy
Duty
Service



Thermoid is the best name in fan belts. Thermoid's famous pre-stretching prevents stretch, slip, wear and fail, the four steps that, in ordinary fan belts, mean added maintenance costs. Thermoid fan belts always stay the correct size.

Insist on Thermoid Fan Belts because it's good business to buy the best! Matched sets are available for belt drive applications where needed.

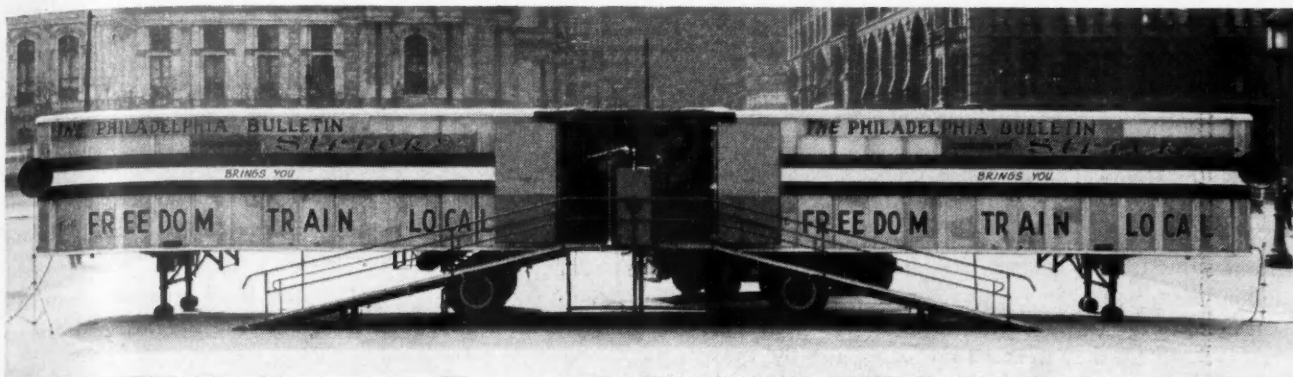
The Thermoid Line

Brake Linings • Clutch Facings • Fan Belts
Radiator Hose • Hydraulic Brake Parts and Fluid
Car Mats • Thermoid Precision Process Equipment
Complete Brake Service Departments

Thermoid Company, Trenton, New Jersey



Interior view of display space looking across the tail-gate joint. Each



Back-to-back the two trailers form into display room almost 70 ft long

New Jersey, and Pennsylvania, the Philadelphia *Bulletin* is co-sponsoring this "Freedom Train Local" with Strick Co.

Other leading newspapers will replace the *Bulletin* as Strick co-sponsors in their own specific areas. Also cooperating are the American Trucking Association, Inc., and the various state motor truck associations which make up the ATA members of the state motor truck associations will furnish the tractors and drivers for the movement of these trailers across the nation.

After the inauguration of the Freedom Train Local in Philadelphia, for example, the first official opening ceremony was held in Bridgeton, N. J., through the cooperation of the Cross Transportation Co. of Bridge-

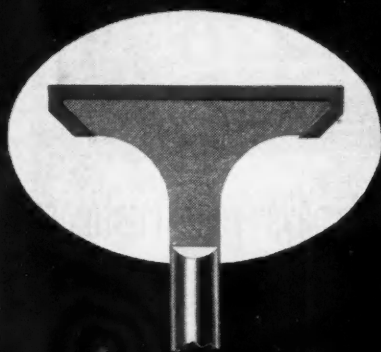
(TURN TO NEXT PAGE, PLEASE)



trailer is completely lined, carpeted and equipped with fluorescent lighting

DO THE JOB RIGHT

Rebuild Your Valves the CLEVELAND HARD FACING WAY



"The Engineered Valve"

HARD FACED VALVES the CLEVELAND WAY

REPRESENT THE MOST MODERN DESIGN FOR
HEAVY DUTY, HIGH COMPRESSION ENGINES.

INTAKE — EXHAUST — SODIUM COOLED

- Save dollars
- Improve Engine performance
- Increase valve and seat life
- Reduce down time and maintenance cost
- Longer mileage per regrind

Gather up those used valves and send them in, or
MAIL THIS COUPON TODAY
CLEVELAND HARD FACING, INC.

Producers of the Engineered Valve

2177 W. 28th St., Dept. A, CLEVELAND 13, OHIO

Please send me price list and complete information on Hard Facing my valves

NAME _____
STREET _____
CITY _____ STATE _____

The Freedom Train Local

Continued from Page 221

ton, N. J., a member of the N. J. Motor Truck Association. The Cross Transportation Co. sent two drivers and two tractors to Philadelphia to pick up the two Freedom trailers and haul them to the City Hall in Bridgeton, N. J., where they were set up for free public inspection.

The entire procedure and the arrangements for the handling of these ceremonies will be responsibility of the local committee in each city. These local committees are composed of appropriate local citizens including the mayor, the chamber of commerce, or the board of trade, or the

business men's association and must include a local trucker, appointed by the state trucking association. In addition to these, it is recommended that the following groups be represented on the local committee: board of education, newspaper, radio station, veteran groups, and religious groups.

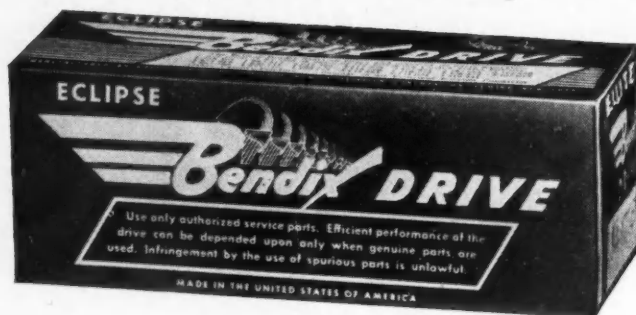
It is the local trucker's responsibility to provide tractors and drivers to pick up the two trailer units at their previous exhibition location and deliver them to the area in their own city at the proper time and place chosen by the local committee. It is the responsibility of the chairman of the local committee to arrange for police clearance, safe location, opening and closing the exhibit, and working with the local committee on any and all ceremonies agreed upon by this group.

The sponsoring newspaper in the locality publishes a daily schedule which is easily identified as the time table of the Freedom Train Local, listing exact locations and dates of exhibition. This includes schools, churches, hospitals, civic groups, and any other places scheduled. At least one week's advance listing is to be presented in each schedule to enable communities to prepare for the arrival of the Freedom Train Local.

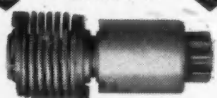
There are 35 millimeter sound films of two minutes' duration available to the local committee for showing in the motion picture houses. This film trailer announcing the arrival of the Freedom Train Local gives the dates and location of the free exhibit and is recommended for advance publicity. An effort should be made by

(TURN TO PAGE 224, PLEASE)

This Box is Worth Money to You!



INSTALL
THIS
DRIVE



RETURN THE
OLD ONE IN
THIS BOX



THEY'RE WORTH
MONEY!

...And pays your customers in greater satisfaction

When you replace with a genuine Bendix* Drive, you get a double return in money. Your customer pays you cash, of course, for the installation of the finest drive you can sell him. Furthermore, the old one is worth money to you when you return it to your Bendix Drive Central Distributor.

The old Bendix Drives are scrapped—That is your assurance that the Bendix Drive you sell is brand new and thoroughly efficient. *Always* replace with the genuine Bendix Drive. *TRADE MARK

Genuine Parts
give Genuine Service

Bendix Drive

ECLIPSE MACHINE DIVISION of
ELMIRA, N. Y.



make
safer drivers
WITH



TACHOGRAPH

THE TIME-TESTED RECORDING SPEEDOMETER*

Safe, confident drivers are the best assets a fleet operator can have because valuable payloads and costly rolling stock must be handled efficiently for profitable fleet operation.

The Tachograph, a unique recording speedometer, builds driver confidence—encourages safer driving. It gives a graphic record of the entire trip of a vehicle. It furnishes a report far more accurate and complete than a supervisor accompanying the driver could give. This practical instrument has proved its value through years of use on thousands of commercial vehicles. Manufactured by Sangamo Electric Co., it is fully guaranteed.



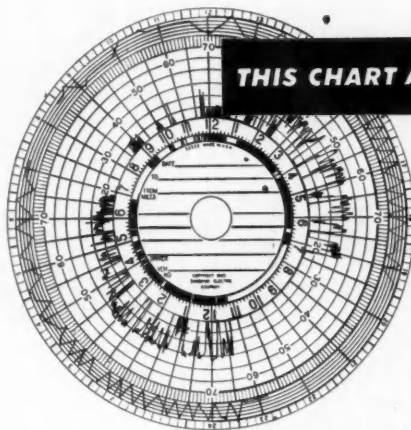
RED LIGHT
WARNING WHEN
SET SPEED IS
EXCEEDED

* HERE'S WHAT A SAFE DRIVER SAYS...



John R. Winter of the Dohrn Transfer Company, Rock Island, Illinois—"1947" Illinois Tractor Trailer Champion says: "We all hated Tachographs at first—now we find that they help us, more than they hurt us. They have saved several of our drivers from unjust speed tickets, and have created a greater degree of safety among our drivers. The Tachograph

has played an important part in helping me build my own personal safe driving record of more than a million miles or sixteen years without a chargeable accident. . . . the Tachograph helps the safe driver to drive safely . . ."



THIS CHART AUTOMATICALLY RECORDS...

- WHEN ENGINE STARTED
- HOW LONG ENGINE IDLED
- WHEN VEHICLE WAS IN MOTION
- HOW FAST IT TRAVELED
- WHEN VEHICLE STOPPED
- DISTANCE TRAVELED BETWEEN STOPS

Write for Bulletin SU-3B

It tells how the Tachograph can help you.

Wagner Electric Corporation

6476 PLYMOUTH AVE., ST. LOUIS 14, MO.

Please send a copy of Bulletin SU-3B.

Name and Position _____

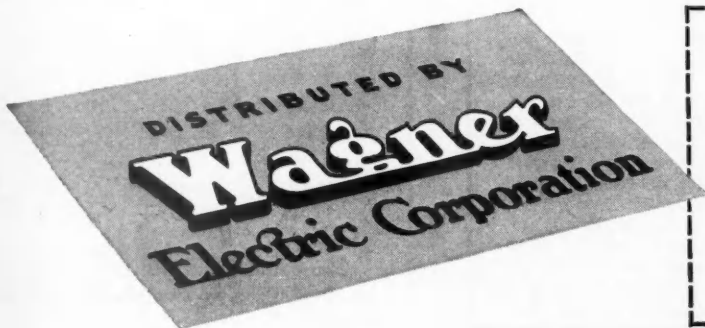
Company _____

Address _____

City _____ State _____

We operate _____ Vehicles
(NUMBER)

S49-1



The Freedom Train Local

Continued from Page 222

the local chairman to have the local churches use the theme of the documents, "Freedom Is Everybody's Job," in the Sabbath services preceding the arrival of the exhibit. An appropriate certificate, commemorating the event, will be presented to all the participants who make possible

the accomplishment of this celebration in each city.

Communities desiring a visit by the Freedom Train Local should contact J. Griffith Rensel, national director, Freedom Train Local, Weightman Building, Philadelphia 2, Pa.; Mr. E. M. Welliver, American Trucking

Associations, Inc., 1424 Sixteenth St., N.W., Washington 6, D. C.; or their local state motor truck association. Or they may write to the editor of this publication.

The Freedom Train Local is a public service of the great American trucking industry dedicated to serving American industry and the American people. It is the trucking industry's contribution to the accomplishment of the Freedom Train slogan—"Freedom Is Everybody's Job!"

JANUARY TRUCKLOADINGS DOWN 5.4%

The volume of freight transported by motor carriers in January decreased 5.4 per cent below December, but increased 2.9 per cent over January, 1948, according to statistics compiled by the Department of Research, American Trucking Associations, Inc.

Comparable reports received by ATA from 303 carriers in 42 states showed these carriers transported an aggregate of 2,726,974 tons in January, as against 2,883,836 tons in December and 2,650,796 tons in January, 1948.

Approximately 81 per cent of all tonnage transported in the month was hauled by carriers of general freight. The volume in this category decreased 5.5 per cent below December, but increased 1.4 per cent over January, 1948.

Transportation of petroleum products, accounting for about 12 per cent of the tonnage, showed a decrease of 2.4 per cent below December, but increased 6.9 per cent over January, 1948.

Carriers of iron and steel hauled about 3 per cent of the total tonnage. Their traffic volume decreased 1.2 per cent below December, but increased 28.9 per cent over January, 1948.

About 4 per cent of the total tonnage reported consisted of miscellaneous commodities, including household goods, textiles, groceries, food products, meat, coal, explosives, paper, heavy machinery, tobacco, grain, motor vehicles and motor vehicle parts. Tonnage in this class decreased 16.0 per cent below December, but increased 1.9 per cent over January, 1948.

Be Prepared!

Mechanic Moe: "Where in the world have you started with that Bible under your arm?"

Mechanic Joe: "I've been hearin' so much about New Orleans: pretty girls, strip shows, free-flowing likker and gals who live easy off guys like me. So I'm goin' down there and try it out."

Mechanic Moe: "But what in the world is the idea of taking a Bible along?"

Mechanic Joe: "Well, if it's as good as they say it is, I might stay over Sunday."



Velvetouch CLUTCH PLATES LAST LONGER

because
THEY'RE ALL-METAL

That's why cost-conscious operators everywhere use genuine Velvetouch exclusively. They know Velvetouch clutch plates run cooler . . . require less maintenance . . . and last longer because they're all-metal. And that Velvetouch can't rot or glaze like asbestos. For extra mileage, safety, and economy . . . equip your own heavy-duty trucks with genuine Velvetouch.



FOR BRAKE AND CLUTCH USE

Velvetouch

25 years of service
1924-1949

THE S. K. WELLMAN CO.

1374 East 51st St. • Cleveland 3, Ohio

Owner-operator Jasper Shay, contract hauler of Cleveland, depends on Velvetouch to keep his tractors rolling.

THE S. K. WELLMAN CO. WAREHOUSING CENTERS

ATLANTA . 119 14th St., N. E.
BOSTON . 171 Brighton Ave.
CHICAGO . 2800 S. Parkway
CLEVELAND . 1392 E. 51st St.
DALLAS . 3407 Main St.
LOS ANGELES 1110 S. Hope St.
PHILADELPHIA 97 E. Montana St.
PORTLAND 636 N. W. 16th Ave.
SAN FRANCISCO 424 Bryant St.
TORONTO, ONTARIO, CANADA
The S. K. Wellman Co., of
Canada, Ltd. 2839 Dufferin St.

Continued from Page 39

1949 Truck Trailer Production*

Vans:	January
Insulated and refrigerated	197
Furniture	42
All other closed top	1,084
Open top	167
Total Vans	1,490
Platforms:	
With cattle and stake racks	98
With grain bodies	26
All other	532
Total Platforms	656
Tanks:	
Petroleum	181
All other	17
Total Tanks	198
Pole and Logging:	
Single Axle	61
Tandem Axle	47
Total	108
Low-bed heavy haulers	89
Dump trailers	30
All other trailers	124
Total Complete Trailers	2,695
Trailer Chassis	71
Total Trailers and Chassis	2,766

* Industry Division, Bureau of the Census.

NEW CANADIAN AXLES

The first Canadian-built speed axles with Hypoid gearing are now rolling off assembly lines of the Timken-Detroit Axle Co. of Canada, Ltd. This marks the first time that Hypoid gearing has been made available to Canadian truckers in Canadian-built vehicles. Hypoid gearing is used for the first reduction and two sets of helical gearing for the second. An axle-mounted power unit, controlled from the cab of the truck, does the shifting.

The axle gear assembly is being produced in Canada under a manufacturing arrangement between The Timken-Detroit Axle Co. of Canada, Ltd., and Canadian Acme Screw and Gear, Ltd., Toronto.

Baptism of Snow



A new FWD Model ZU operated by Shawano (Wis.) County Highway Dept. handling first cut of a one-foot snow at average speed of 25 mph

1949 Domestic Truck Factory Sales by Gross Vehicle Weight

	5,000 lb. and Less	5,001-10,000	10,001-14,000	14,001-16,000	16,001-19,500	19,501-26,000	Over 26,000	Total
January	31,918	25,697	10,537	15,085	4,077	2,678	1,290	91,282
February	32,799	25,543	10,504	13,708	2,913	1,781	1,291	88,540
Total	64,717	51,240	21,041	28,793	6,990	4,459	2,581	179,822

HIGHWAY TAXES SET RECORD

The nation's highway users are bearing their heaviest national and state tax load, figures made public today by the National Highway Users Conference show. The state tax bill may be increased by efforts in 23

states to raise gasoline tax rates, the N.H.U.C. noted.

On the Federal side, highway users buying new cars or other vehicles, repairing old ones, or buying gasoline, oil, tires and

(TURN TO NEXT PAGE, PLEASE)

SIEBRING

STEAM CLEANER

NEW Simplified Model

AT Amazing LOW
FACTORY-TO-YOU PRICE

Only
\$197⁵⁰

F.O.B. FACTORY
GEORGE, IOWA

101 USES

Portable unit for
cleaning TRACTORS,
IMPLEMENTS, MA-
CHINERY, MOTORS,
PARTS, AUTO WASH-
ING and 101 OTHER
TOUGH JOBS.

CUTS Cleaning Time in HALF!

... SPEEDS Repairs!

Here's a time-saving, job-speeding, money-making piece of equipment for every repair or maintenance shop. Provides instant steam, hot water, or both, UNDER PRESSURE with powerful, cutting chemicals. Knocks grease and grime in a hurry. Service free! Simple to operate! Safe and economical! Try it in your shop AT OUR RISK. Write for literature or order direct from this ad.

SIMPLE TO OPERATE

Really SAFE TO USE!

Burns low cost fuel oil or gas!
Electric units also available!
Not dependent on city water
pressure or electricity. Pro-
vides continuous steam. Com-
plete with air pump and in-
jector valve.

MAIL THIS COUPON

WRITE FOR LITERATURE AND 10 DAY TRIAL OFFER

SIEBRING MFG. CO.
Dept. CC-3, George, Iowa

☐ Send steam cleaner descriptive literature and 10 Day Trial Offer.

Name.....

Address.....

City..... State.....

CCJ NEWSCAST

Continued from Page 227

tubes, paid a new record of \$1,179,865,000 in temporary Federal automotive excise taxes in 1948, the Conference reported. These emergency taxes go into the Government's general funds. Hundreds of highway user groups, representing a combined membership in the millions, have called for their repeal.

A new record was also set by highway

users' payments of special state taxes used for highway purposes. They increased some 55 per cent in 1948 over 1941, reaching an unprecedented total of \$1,836,000,000. These payments by highway users increased at a much faster percentage rate than the funds made available for highway purposes from state and local general funds.

According to an N.H.U.C. survey, slow progress is thus far being made by advocates of higher state gasoline taxes. In most cases, motor vehicle taxpayers are demanding proof of the need for increases, and also urging more efficient spending of revenues already available.

HARVESTER CREDIT SUBSIDIARY

Organization of a wholly-owned subsidiary, to be known as the International Harvester Credit Corp., has been announced by the International Harvester Co. Its purpose will be to finance domestic notes receivable of the International Harvester Co. for which there is no other source of financing available.

In announcing the organization of the new subsidiary finance company, Harvester officials stated that the recent growth of credit sales shows that the time is at hand when Harvester needs new credit financing to supplement the financing of its sales by banks and other financial institutions. They emphasized, however, that banks and other financial agencies will continue to be the principal source for financing of the company's time sales. The new credit corporation will take notes only when, for some reason, customers with good credit cannot borrow locally or elsewhere.

TRUCK SALES OFF SLIGHTLY

New truck registrations were down slightly in comparison with registrations for January, 1948, according to R. L. Polk & Co. The 45 state summary shows a count of 55,318 new trucks registered, as compared with 56,012 from the same states in Jan. 1948. It is expected that the total new truck registrations for the month will end at approximately 68,000 units.

January new passenger car registrations, however, were greater than for January, 1948 and January, 1947, refuting a belief that new car sales, as indicated by registrations, have gone downward since the first of the year. In the 45 states tabulated the total new car registration count was 224,308, as compared with 221,741 from the same states for Jan., 1948. The total for the month should be approximately 278,000. This would compare with a total registration of 274,978 for January, 1948, and 209,063 for January, 1947.

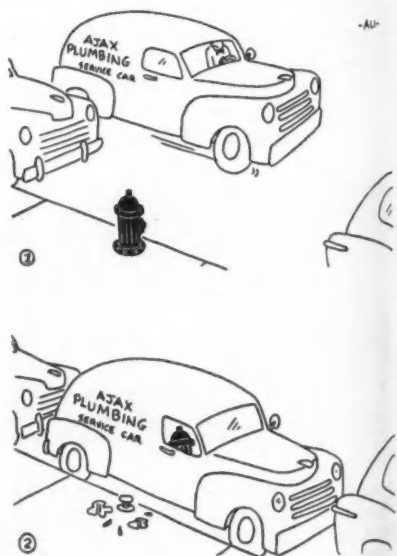
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THE REAL REASON FOR RIBS...

Brake drums in heavy duty service are subject to severe flexing stresses imposed by the pressures of of the shoes, tending to stretch the drum out of shape; and high temperatures, sometimes running to over 1000°. The characteristic ribs on GUNITE Brake Drums look like cooling fins but are not. Their purpose is (1) to stiffen the drum and hold it in shape against the shoe pressures, (2) to permit the use of thinner sections and thus reduce internal compressive and tensile stresses that produce "heat check", and (3) to permit axial expansion of the braking surface at high temperatures, further tending to prevent heat check and breakage. The GUNITE rib design was developed by hundreds of gruelling over-the-road tests and its effectiveness has been demonstrated by a thousand million miles of silent proof. Buy RIBBED Gunites for heavy duty braking!

Write for our new folder giving further information on the advantages of ribbed drums.



The Better Buy **for BIGGER Value**



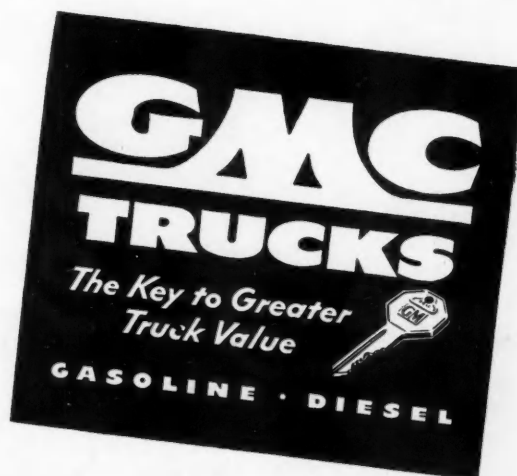
GMCs are available in models and types, engines and wheelbases, chassis and equipment options to provide exactly the right truck for every highway transport need.

Because of the outstanding engineering, testing and manufacturing facilities of the world's largest exclusive producer of commercial vehicles.

Because of a nationwide network of specially equipped and expertly manned factory-operated branches and dealer service stations.

Because of a new and extensive parts warehousing program assuring fast, flexible distribution of GMC parts to every section of the country.

Because of products that are truck-built throughout . . . providing engines and chassis that are famous for long-life, low-cost operation.



GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

COMMERCIAL CAR JOURNAL, April, 1949

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CCJ NEWSCAST

Continued from Page 227

tubes, paid a new record of \$1,179,865,000 in temporary Federal automotive excise taxes in 1948, the Conference reported. These emergency taxes go into the Government's general funds. Hundreds of highway user groups, representing a combined membership in the millions, have called for their repeal.

A new record was also set by highway

users' payments of special state taxes used for highway purposes. They increased some 55 per cent in 1948 over 1941, reaching an unprecedented total of \$1,836,000,000. These payments by highway users increased at a much faster percentage rate than the funds made available for highway purposes from state and local general funds.

According to an N.H.U.C. survey, slow progress is thus far being made by advocates of higher state gasoline taxes. In most cases, motor vehicle taxpayers are demanding proof of the need for increases, and also urging more efficient spending of revenues already available.

HARVESTER CREDIT SUBSIDIARY

Organization of a wholly-owned subsidiary, to be known as the International Harvester Credit Corp., has been announced by the International Harvester Co. Its purpose will be to finance domestic notes receivable of the International Harvester Co. for which there is no other source of financing available.

In announcing the organization of the new subsidiary finance company, Harvester officials stated that the recent growth of credit sales shows that the time is at hand when Harvester needs new credit financing to supplement the financing of its sales by banks and other financial institutions. They emphasized, however, that banks and other financial agencies will continue to be the principal source for financing of the company's time sales. The new credit corporation will take notes only when, for some reason, customers with good credit cannot borrow locally or elsewhere.

TRUCK SALES OFF SLIGHTLY

New truck registrations were down slightly in comparison with registrations for January, 1948, according to R. L. Polk & Co. The 45 state summary shows a count of 55,318 new trucks registered, as compared with 56,012 from the same states in Jan. 1948. It is expected that the total new truck registrations for the month will end at approximately 68,000 units.

January new passenger car registrations, however, were greater than for January, 1948 and January, 1947, refuting a belief that new car sales, as indicated by registrations, have gone downward since the first of the year. In the 45 states tabulated the total new car registration count was 224,308, as compared with 221,741 from the same states for Jan., 1948. The total for the month should be approximately 278,000. This would compare with a total registration of 274,978 for January, 1948, and 209,063 for January, 1947.

(TURN TO PAGE 230, PLEASE)

GUNITE RIBBED • HEAVY DUTY BRAKE DRUMS



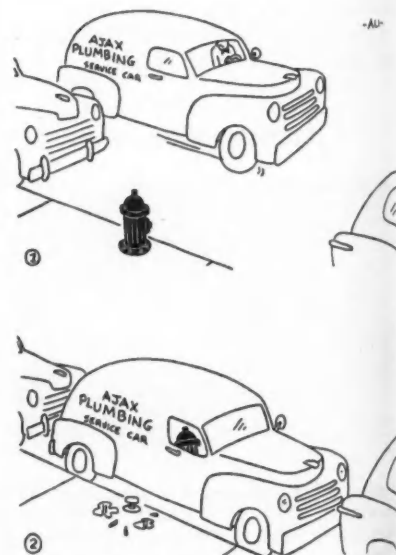
THE REAL REASON FOR RIBS...

Brake drums in heavy duty service are subject to severe flexing stresses imposed by the pressures of of the shoes, tending to stretch the drum out of shape; and high temperatures, sometimes running to over 1000°. The characteristic ribs on GUNITE Brake Drums look like cooling fins but are not. Their purpose is (1) to stiffen the drum and hold it in shape against the shoe pressures, (2) to permit the use of thinner sections and thus reduce internal compressive and tensile stresses that produce "heat check", and (3) to permit axial expansion of the braking surface at high temperatures, further tending to prevent heat check and breakage. The GUNITE rib design was developed by hundreds of gruelling over-the-road tests and its effectiveness has been demonstrated by a thousand million miles of silent proof. Buy RIBBED Gunites for heavy duty braking!

Write for our new folder giving further information on the advantages of ribbed drums.



GUNITE CAST WHEEL ASSEMBLIES FOR TRAILERS AND TRUCKS INCLUDE FAMOUS GUNITE BRAKE DRUMS



The Better Buy **for BIGGER Value**



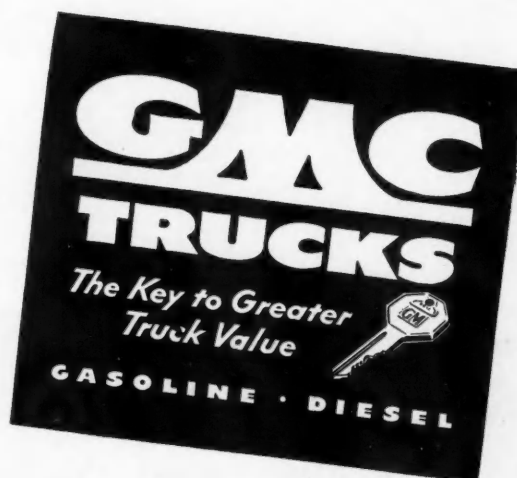
GMCs are available in models and types, engines and wheelbases, chassis and equipment options to provide exactly the right truck for every highway transport need.

Because of the outstanding engineering, testing and manufacturing facilities of the world's largest exclusive producer of commercial vehicles.

Because of a nationwide network of specially equipped and expertly manned factory-operated branches and dealer service stations.

Because of a new and extensive parts warehousing program assuring fast, flexible distribution of GMC parts to every section of the country.

Because of products that are truck-built throughout . . . providing engines and chassis that are famous for long-life, low-cost operation.



GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION
COMMERCIAL CAR JOURNAL, April, 1949

CCJ NEWSCAST

Continued from Page 228

TRAINEE REGULATION

Employers of veterans training on-the-job under the G. I. Bill should notify their State approving agency of any plans to change wage scales or journeymen's rates of pay, according to the Veterans' Administration.

The agency to be notified is that which approved the establishment for veterans' training. In most states, approvals are handled by State Boards of Education.

FRUEHAUF SERVICE CLINICS

As a climax to its \$3,000,000 shop service improvement campaign, Fruehauf Trailer Co. has concluded five one-week shop training clinics for service managers and mechanics in a move to assure uniformity of repair charges in all of its service branches throughout the country.

Approximately 175 men took part in the four separate clinics at Cleveland where they took short but intensive courses in the use of all new equipment and where they learned the factory formula for arriving at uniform prices for various types of repairs. Fruehauf officials pointed out that the main advantages to the program will accrue to

trailer operators who may require service and repairs in the Fruehauf service departments from coast to coast.

The \$3,000,000 improvement campaign has extended for more than two years during which the Fruehauf Co. has stocked its shops with the finest and newest equipment available.

COMPLETE RECIPROCITY FOR HOUSEHOLD CARRIERS URGED

James F. Rowan, executive secretary of the Household Goods Carriers' Conference, American Trucking Associations, Inc., has entered a strong plea before a meeting of officials of ten southeastern states for complete reciprocity among the states with respect to moving vans.

Mr. Rowan called for a "rule of reason" at a meeting called by Walter R. MacDonald, chairman of the Georgia Public Service Commission, to discuss truck reciprocity.

"Full and complete reciprocity is the vital bloodstream of our business," he said. "Without it our services could not be made available to the general public because: movers operate a call and demand service over irregular routes and in comparatively wide territory; a specialized personal service is required by each individual shipper; it is highly important that the pickup and delivery of each shipment be timed and executed on the basis of agreed arrangements to avoid disappointing, costly experiences and hardship for the owner of the goods."

"I am here to plead with you," he added, "for an arrangement which we earnestly believe to be in the public interest and in the interest of the several hundred movers domiciled in the southeastern states who, if restricted by non-reciprocal arrangements, may not travel into other states for the purpose of transporting the household goods and personal effects for those shippers who have been attracted to and have decided to take up domicile in the South."

"Reciprocity is a good thing—not just a good thing for truck operators but a good thing for the state."

(TURN TO PAGE 234, PLEASE)

For Best Results
CONTACTS Must
Be Good!



Add smoothness, and all-round motor performance to EVERY motor job. Replace with ECHLIN Ignition Contacts every time!

MIRROR FINISH TUNGSTEN
FREE FLOATING SPRING
COPPER CONDUCTOR STRIP
GREATER PRECISION

ECHLIN quality assures longer Contact life. Spark Fleet engines to higher performance levels with this superior Contact!



ECHLIN

Ignition

ECHLIN MANUFACTURING COMPANY
234 EAST STREET • NEW HAVEN 5, CONN.



CONTACTS
COILS • CONDENSERS
& OTHER AUTOMOTIVE
ELECTRICAL PARTS



is the **ONE** Belt that is

Specially Engineered for

TRUCKS *and* BUSES

ACTUAL RECORDS

Show **TWO** Big SAVINGS
That *No Other Belt* Can Give You!

The *signed* statements of well-known Fleet Operators which appear on these two pages are worth the careful attention of every Truck and Bus owner who is interested in *reducing* his costs and *increasing* his profits.

These statements show that the Gates Truck Belt—the belt that is *specially engineered* for Trucks and Buses—is giving Fleet Operators, all over the U. S., from 50% to 80% longer service than any other belt they have ever used!

This *much longer* service delivered by the Gates Truck Belt means an *immediate saving* in your belt costs—a saving that is added directly to your *net profits*.

This saving is *important*—you will agree—yet the Fleet Operators who are using the Gates Truck Belt tell you that this *specially engineered* belt gives them another gain in profits that is even *more important*!

Biggest Saving Comes from Reducing Road Delays

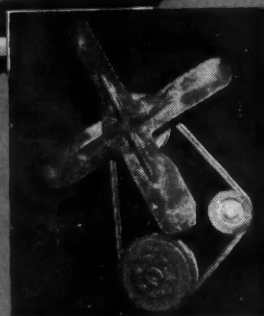
Every one of these operators, you will notice, *emphasizes particularly* the *great reduction* in road-delays of units that are equipped with Gates Truck Belts. They emphasize this because, as you know, the saving of road delays is a very big factor in increasing *net operating time*—the one thing that pays them (or you) a profit.

We believe that after reading these definite, factual statements of other experienced Truck and Bus Operators you will surely want for yourself the very substantial savings delivered by Gates Truck Belts. Gates jobbers in every city can supply you promptly.



REG. U. S. PAT. OFF.

The Mark of Specialized Research



You Wouldn't Use
a Passenger Car Tire
on a Truck!

Why Use a
Passenger Car BELT?

The moment you think of it, you know that the belt on a typical truck must carry more than 3 times the horsepower load of a passenger car belt. Moreover, all the other strains and stresses—the hours of continuous operation—the speed of acceleration and deceleration—the starts, the stops—the idling in low gear—all are far greater in the case of Truck Belts. Isn't it only the part of wisdom, then, to use the belt that is *specially engineered* for this more demanding service—the GATES TRUCK BELT!

Gates Belt Jobbers
in Every City
Can Supply You Promptly.

THE GATES RUBBER COMPANY

DENVER 17, U.S.A.

World's Largest Makers of V-Belts

CCJ NEWSCAST

Continued from Page 230

HOME TOWN NOTES

Cleveland: American Brake Shoe Co. has expanded sales activities in Cleveland with the addition of representatives of the National Bearing Division in its sales offices at 915 Midland Building.

Fort Worth: A new International truck sales and service headquarters at 520 East Lancaster Ave. (U. S. 80), Fred W. Swan is branch manager.

Los Angeles: Lawrence Shriver Co., 714 Olympic Blvd., has been appointed sales representative for the Wix Accessories Corp., Gastonia, N. C.

New York: Kennametal Inc. of Latrobe, Pa., (cemented carbide products) has moved its New York office to 11 West 42nd Street. L. D. Morton is acting Manager.

Petersburg, Va.: Starr Co., Inc. is sales representative for Penn Drake products manufactured by Pennsylvania Refining Co.

Philadelphia: L. J. Miley Co. is now operating a rebuilding plant for brake shoes

at 5528 North Second St. Brake shoes, both riveted and bonded, in the Eastern area may now be returned to this more centrally located plant for reconditioning and relining.

Washington, D. C.: C. S. Carpenter Co., 4707 Connecticut Ave., is now sales representative for Penn Drake Gumout made by Pennsylvania Refining Co.

4.5 MILLION VEHICLES IN '48

During 1948 a total of 3,490,952 new passenger cars and 1,035,174 trucks was registered in the United States, according to R. L. Polk & Co. A combined total of 4,526,126 new motor vehicles was registered, representing retail sales by dealers throughout the country.

The total for 1948 was the highest since resumption of automotive production in 1946, but not as high as for 1941. In 1947 the total new passenger cars registered was 3,167,231; in 1946—1,815,196; and in 1941—3,731,166.

ATA OPPOSES "CEMENT" BILL

The American Trucking Associations, Inc., has informed the Senate Judiciary Committee it is flatly opposed to a bill which it contends would encourage Portland Cement manufacturers to perpetuate their practice of insisting on use of rail service only in shipping cement.

Edgar S. Idol, general counsel of the association, has informed Senator Patrick A. McCarran (D., Nev.), chairman of the committee, that the association "is compelled to oppose" Senate Bill 1008 which proposes a moratorium on application of certain anti-trust laws to individual, good-faith, delivered-price systems and freight absorption practices.

In his letter, Mr. Idol declared such legislation would enable and encourage Portland Cement manufacturers to perpetuate a practice "objectionable both to the consumer and the motor carrier industry."

GOODRICH SALES APPOINTMENTS

The B. F. Goodrich Co. has organized its Associated Lines Sales division into five sales regions and appointed four managers in newly-created geographical areas. The division handles sales of Brunswick, Diamond, Hood and Miller brands of tires and accessories.

The new division managers and their headquarters' cities are: F. H. "Hal" Newsum, Dallas; H. G. "Cubby" Culbertson (northeastern) Akron; Benton Thompson, Springfield, Ill., and H. M. Rockwell (southeastern) Akron, Ohio. K. K. Kanter continues as manager of the Pacific Coast division at Los Angeles, a post he has held for several years.

CANVAS FIRM SOLD TO EMPLOYEES

The Wagner Awning & Mfg. Co., Cleveland, manufacturers of truck tarpaulins, special fitted covers, and other canvas products used by the trucking industry, has been sold to its employees. Carlton R. Forward, retiring president of the 84-year-old firm

(TURN TO PAGE 280, PLEASE)

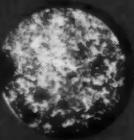
NOTE THE DIFFERENCE with

SPRINGFIELD

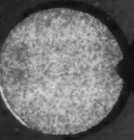
HYDROGEN WELDED

IGNITION CONTACTS

This is the ordinary tungsten contact grain structure.



This is the SPRINGFIELD Superpoint contact grain structure.



Springfield Superpoint tungsten discs are furnace welded in an atmosphere of hydrogen, and NOT SPOT-WELDED, forming a perfect bond.

Stationary contact bars or screws are radius ground and polished in conformity with original specifications.

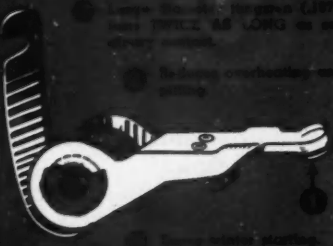
For continuous smooth power...

Specify **SPRINGFIELD SUPERPOINTS**

Made By The Makers Of The Famous Springfield Superpoint Condensers

Look Where SPRINGFIELD SUPERPOINT Heavy Duty Contacts are better!


- Longer Service Life—Up to 100,000 miles or more.
- No burning, chattering, and pitting.
- No need for frequent adjustment.



THIS COLORFUL METAL CABINET IS SUPPLIED

with purchase of a moderate, well-balanced stock as shown.

- Handy space for carrying and concentrated guide.
- Extra drawer for surplus stock.
- For display on counter or wall.



SPRINGFIELD ELECTRICAL SPECIALTIES, INC.

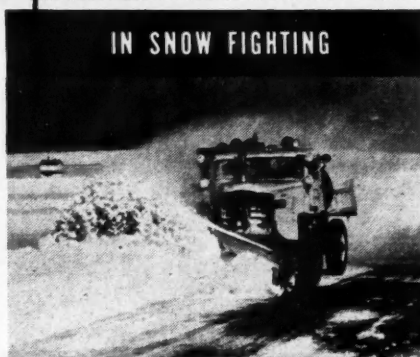
170 WEST 42ND STREET, NEW YORK 36, N. Y. • Export Department, 170 West 42nd Street, New York 36, N. Y.



WALTER SNOW FIGHTERS

*earn their keep
the year 'round!*

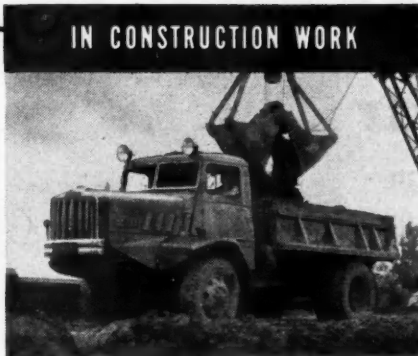
IN SNOW FIGHTING



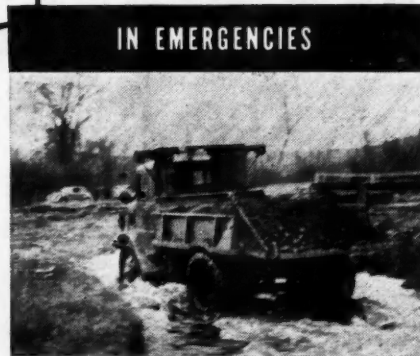
IN ROAD MAINTENANCE



IN CONSTRUCTION WORK



IN EMERGENCIES



NOW that winter is over, Walter Snow Fighters begin paying a bonus in continued all-around usefulness to highway departments. Take off the plows and put the big, powerful, 100% traction Walter truck to work on any job requiring a heavy-duty truck . . . and many jobs no other trucks can do.

Often, instead of the usual dump body, many communities equip their Walter Snow Fighters with auto-eductor bodies, crane and wrecking equipment, street sprinklers and other special equipment to get year-round service. With the non-slipping traction of Walter 4-Point Positive Drive, these units operate in all weather and running conditions, on or off the highway.

● If your past winter's experience shows the need for more powerful and dependable snow removal equipment, investigate the many combinations and advantages available with Walter Snow Fighters. See your Walter distributor—or, write us for literature and details.

WALTER

4-POINT POSITIVE DRIVE

SNOW FIGHTERS

WALTER MOTOR TRUCK CO.

1001-19 Irving Ave.
Ridgewood 27, Queens, L. I., N. Y.

Washington Runaround

Continued from Page 10

given additional duties including the establishment of policies, procedures, and guidance for the allocation of available space, issuance of movement directives, and establishment of priorities for the transportation of personnel and material of the armed forces. It will be responsible also for making decisions where requirements of the services exceed available transportation, and where diversion from one form of transportation is required.

Price System Moratorium

Congressional strategy on the delivered pricing tangle now calls for enactment of legislation establishing a moratorium until July 1, 1950, on antitrust statutes applying to pricing systems. Earlier attempts to enact legislation directly legalizing freight absorption and delivered prices have been passed by for the current session of Congress. The moratorium legislation sponsored by Senator Myers and Representative Walter, both Pennsylvania Democrats, would permit businessmen to absorb freight and quote delivered prices provided no conspiracy was evident, without fear of prosecution. Congressional

leaders have decided to push the Myers-Walter measure in the hope that the Supreme Court's forthcoming decision in the rigid conduit case will correct the uncertainty created by the court's decision in the cement case.

Ordnance Purchase Plans

A breakdown of the number of vehicles which Army Ordnance expects to purchase if Congress approves its request for \$83 million for this purpose reveals a surprisingly large number of heavy vehicles. Proposed purchases of motor vehicles are very substantial in view of the negligible procurement of vehicles since the end of the war. If Congress approves the entire amount requested, Ordnance expects to purchase the following vehicles: 6320, 3-ton 4x4's; 2663, 3/4-ton 4x4's; 6705, 2 1/2-ton 6x6's; 589, 5-ton 6x6's; and 1220 light sedans.



BIEDERMAN

The All-Star Truck

- ★ Advanced Design
- ★ Ready Accessibility of all Parts
- ★ Sturdy Construction
- ★ Dependable Power
- ★ Capacity for Big Loads

DEALERS: The Biederman National Standard Model, the peacetime successor to a long line of quality trucks since 1920, is a truck you cannot afford not to investigate. Nothing but the most sturdily constructed units by America's leading manufacturers are built into it. It's an All-Star team in itself. It has strength, durability, comfort for the long trip, easy accessibility of every part and modern design.

This is your opportunity to secure the Sales Franchise of a quality product. There is still some territory open. Write or wire us today for complete specifications.

BIEDERMAN MOTORS CORPORATION
CINCINNATI 14, OHIO

Washington Miscellany

The Army Transportation Corps reports that its affiliation program for highway transportation reserve units is 86 per cent complete. Forty per cent of the units have been activated . . . The newly created State of Israel has received an Export-Import Bank credit in the amount of \$6 million for the purchase of American trucks and buses. This will provide for an increase of nearly 20 per cent in the size of the truck and bus fleets operating as common carriers in that country. However, only the chassis of the heavy trucks and buses will be bought in this country, with the bodies being built in Palestine . . . Representative Priest has introduced a bill which would make it a Federal crime to transport in interstate or foreign commerce trailers or semitrailers knowing that they have been stolen . . . A self-liquidating \$10-billion superhighway system would be constructed over the next few years under terms of a bill in Congress sponsored by Representative Harley Staggers (Democrat, of West Virginia). Dual roads would be constructed, one for passenger cars and the other for trucks and buses. Bonds would be sold for financing the construction and a toll system would liquidate the bonds and provide maintenance . . . Production of truck trailers during January amounted to 2,766 units, according to the Bureau of Census. This was a decrease of 19 per cent from the 3,426 units produced in December and was 18 per cent below the January 1948 output of 3,378 units . . . The Department of Commerce has permitted an increase in the amount of natural rubber that may be used in the production of inner tubes 9.00 cross-section and smaller. Forty per cent of the output of a manufacturer may now be made of natural rubber, with the remaining 60 per cent butyl. Previously, 80 per cent of a producer's output of popular-size passenger car and small bus and truck tubes had to be made of butyl . . . The Interstate Commerce Commission has issued new regulations pertaining to the packaging of explosives and other dangerous articles.

END

(Please resume your reading on P. 15)

"I'm stalled
on the 9 Mile Road"



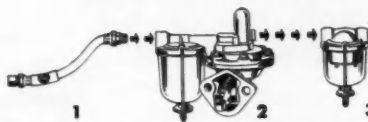
**THE AC FUEL PUMP SYSTEM
HELPS KEEP YOU
OUT OF TROUBLE**

It means delay and expense when your driver 'phones that the fuel system failed out in the country.

Two simple precautions will avoid such costly failures: 1—Be sure the fuel pump is an AC, heart of the fuel system on over 35,000,000 motor vehicles. 2—Inspect the AC Fuel Pump, at regular intervals, for pressure and flow . . . and do as many operators do, replace all pumps at specified mileages.

Complete 3-way protection can be assured by using the other two units of the AC Fuel Pump System . . . the AC Gasoline Strainer and the AC Flexible Gasoline Line.

AC FUEL PUMP SYSTEM



1. Leaky fuel lines are not only dangerous, but cause faulty operation of the fuel pump. Install a new AC Flexible Gasoline Line when you replace your fuel pump. 2. AC Fuel Pump, Heart of the Fuel System. 3. AC Gasoline Strainer keeps dirt and water out of carburetor, promotes easy starting and protects delicate carburetor parts. Your fuel system needs one.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

COMMERCIAL CAR JOURNAL, April, 1949

The Conference Corner

Continued from Page 30

Slightly Impure Water Won't Do Much Damage

by H. B. Birt
Service Department

Delco-Remy Division, GMC

as 'pure water,' 'acceptable purity,' 'tap water,' 'well water' and so forth. Generally speaking, battery manufacturers maintained their stand in this matter until the outbreak of World War II. It was then discovered that in an atmosphere of global war the use of distilled water for battery maintenance was an utter impossibility.

"At the close of the war, many men who had received training in automotive maintenance during service brought wartime information into civilian circles. Apparently this information has been widely misinterpreted, and many battery service men now are under the impression that any 'city water' ('tap water') or even 'well water' is entirely satisfactory for battery use. Actually, nothing could be further from the truth.

"From a quantitative chemical standpoint, the terms 'city water,' 'tap water,' and 'well water' are meaningless. Samples from different communities vary between wide extremes insofar as dissolved mineral content is concerned. It is not uncommon to find water with a very low mineral content in one community and water with a very high mineral content in a community only a few miles distant. The water taken

"For many years battery manufacturers specified that only distilled water be used in lead-acid storage batteries. This specification had the great virtue of simplicity and eliminated the need for defining such vague and indefinite terms

from adjacent wells can also show such wide variations. Obviously, it would be foolhardy for a battery manufacturer to approve water for battery use on any such general basis.

"Many metals and mineral compounds and various organic materials are recognized as being harmful to storage battery performance. The relative effect of these impurities, of course, varies considerably. Some are very harmful even in extremely small quantities while others can be tolerated in relatively large concentrations. Since all minerals which enter a battery in the filling water normally remain in the cells, the continued use of impure water can lead to a harmful concentration of impurities. Thus water which might be acceptable for one refilling, or even occasional refilling, may not be acceptable for continuous use in the same battery. In other words the chief aim in choosing water for battery use is to avoid the introduction of sufficient quantities of any impurity to cause a noticeable loss of battery performance or life. Obviously, distilled water meets this requirement best because it adds no impurities at all, but water of lesser purity may be found satisfactory on the basis just described.

"A further consideration in this matter of water purity, which is not generally recognized, is that the type of service which the battery receives is of considerable importance. For instance, a battery which receives short intermittent service and which stands idle for fairly long periods will be quite vulnerable to an impurity like copper or iron which increases self-discharge. On the other hand, a battery in a vehicle which is in active use may show little indication of the presence of an equal quantity of the same impurities. Similarly, an impurity which affects only one set of plates (positives or negatives) may or may not cause serious trouble depending upon whether the type of service places special strain on the plates affected."

(TURN TO PAGE 240, PLEASE)



are your motors gas sots?

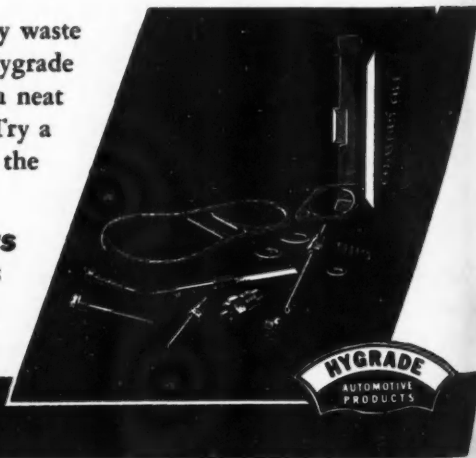
recondition with

HYGRADE

contain-all carburetor kit

You know nothing steals gas like a faulty carburetor. Why waste fuel-dollars when you can rebuild old carburetors with Hygrade contain-all kits? Every precision-tooled part you need is in a neat box. And there's a kit for every popular type of carburetor. Try a contain-all kit on one vehicle, and you'll be using them on the fleet! Write us or see your jobber.

**fuel pumps • fuel filters
fuel pump kits and parts
carburetor kits and parts
speedometer parts**



HYGRADE PRODUCTS DIVISION • Standard Motor Products, Inc.

35-35 Thirty-Fifth Street, Long Island City 1, New York

HEIN-WERNER HYDRAULIC JACKS ARE BETTER BUILT

FROM RAM HEAD TO BASE!



CIRCULAR GROOVED RAM HEAD
FOR SAFE SURE GRIP

MALLEABLE IRON TOP NUT
FOR EXTRA STRENGTH AT POINT OF STRAIN

PRESSURE BY-PASS TO PREVENT
OVER-TRAVEL OF RAM

CANNOT LOWER ACCIDENTALLY AS HANDLE MUST
BE REMOVED TO OPEN RELEASE VALVE

FACTORY TESTED AT
1 1/2 TIMES RATED CAPACITY

STURDY MALLEABLE IRON HANDLE
SOCKET . . . FULCRUM POINT OF JACK

HEIN-WERNER
HYDRAULIC JACK
MODEL JAC
OIL LEVEL
LOW-9"
INSTRUCTIONS
TO RAISE - TURN RELEASE VALVE
TO LOWER - TURN RELEASE VALVE
TO OIL - OIL - OIL - OIL - OIL - OIL
HEIN-WERNER MOTOR

PRECISION MACHINING THROUGHOUT TO
ASSURE PERFECT PERFORMANCE, LONG WEAR

EXCLUSIVE HEINITE PISTON . . . PROVEN TO WITHSTAND TEN
TIMES THE WEAR OF CONVENTIONAL CUPS OR PACKINGS

PRESSURE TESTED MALLEABLE IRON SLED TYPE
BASE GIVES SOLID, SAFE SUPPORT

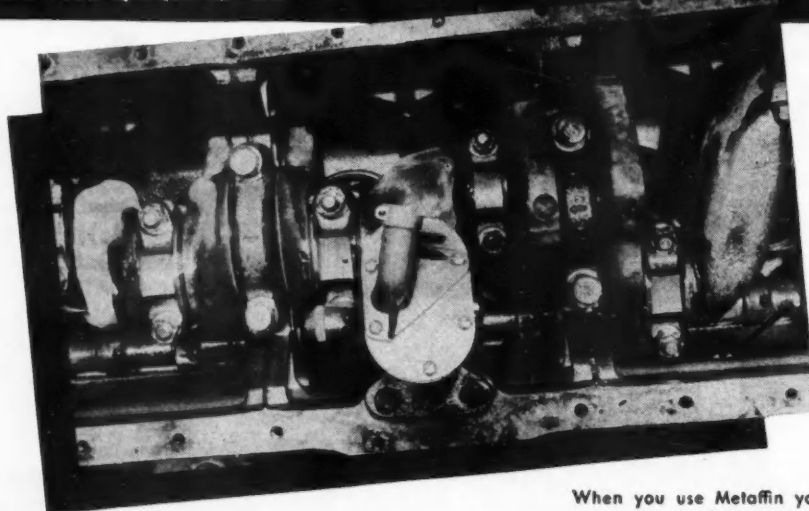
...to give FASTER... SAFER SERVICE!

Hein-Werner
HYDRAULIC JACKS

HEIN-WERNER CORPORATION • Waukesha, Wis.

Made in models of 1 1/2, 3, 5, 8, 12,
20, 30, 50 and 100 tons capacity, as
well as Bumper-Lift Jacks for passenger
cars and service jacks for shop use.
See your Hein-Werner distributor or
write us for details.

SLUDGE COSTS YOU MONEY!



When you use Metaffin you can count on clean engines.

YOU SAVE with Magnus Metaffin!

Safe, economical Magnus Metaffin prevents sludge from forming in the engine, and ends the waste and damage caused by sticking valves and rings, clogged oil lines, burned out bearings, etc. Here are three typical case histories that prove its effectiveness over long service periods:

Bakery Fleet: 70 Internationals in stop-and-go service that is a natural sludge builder. Ten years of Metaffin use. Engines are always sludge-free, and NO valve troubles are experienced. Metaffin-treated reclaimed oil is changed weekly, regardless of mileage.

Delivery Service: 30 Chevrolets on short-haul routes. Eight years of Metaffin. Using reclaimed oil, treated with Metaffin, they save 16¢ per gallon on their lube oil. Maintenance and repair costs have been remarkably low for 8 years, and sludge troubles nonexistent.

Wholesale Grocery Fleet: 8 gasoline and 10 diesel trucks on long haul service. Have used Metaffin since 1938. Used to have plenty of trouble with seized rings, burned out bearings and lubrication injector failures. Metaffin has ended them and sharply reduced maintenance and repair costs.

Metaffin will pay you handsome dividends in trouble-free operation. Write for Bulletin 23.

MAGNUS CHEMICAL COMPANY • 38 South Ave., Garwood, N. J.

In Canada—Magnus Chemicals, Ltd., 4040 Rue Masson, Montreal 36, Que.

Service representatives in principal cities



Conference Corner

Continued from Page 238

Play Safe and Use Only Approved Water

by Carl G. Reetz
Director of Engineering
Reading Batteries, Inc.

"The action of the various battery parts in producing electrical energy is purely chemical and any foreign matter that may be added either hastens or delays this chemical action.

"The only ingredient within the case that is lost in the chemical reactions is the water in the electrolyte, and from time to time this water must be replaced. It is in this replacing of lost water that ingredients may easily be introduced into the battery that will seriously hamper the efficiency of the battery in service.

"Calcium chloride and iron are the most common ingredients found in ordinary drinking water that are very detrimental to the life and activity of the storage battery. Some other injurious matters that may be found in drinking water are aluminum, magnesium, phosphorus, sulphur, chlorides, copper, etc. None of these may be present in sufficient quantity to detract from the purity and palatability of water for drinking purposes, but could be very harmful to a battery.

"To be sure that the water you add to your battery will not hamper its efficiency, it is much less expensive to play safe and add water that is approved for use in batteries. In some localities the water may require distilling, in others some form of filter treatment, but in very few parts of the world can water be taken from the 'tap' and be put into your battery without in some way working to its detriment.

"Though slightly impure water is better than no water at all . . . play safe and use only water approved for battery use."

Filter the Water When Possible

by W. J. Harris
Vice President, Director of Sales
Monarch Battery Co., Inc.

"The ideal situation would be to use distilled water in all cases, but this is not always available; so the more practical viewpoint to be taken, and I personally believe is the practice used generally throughout, is to filter the water when at all possible.

"The locations of cities and towns (TURN TO PAGE 243, PLEASE)

Conference Corner

Continued from Page 240

play an important part, because various sections of the country give a higher mineral content in water, particularly iron and chlorine. The iron content does cause certain internal resistance and sulphate detrimental to a battery; the chlorine substance in water, based on its extensive use, has certain deteriorating effect on plates and separators detrimental to the battery. That is why we say the ideal situation would be to use distilled water in all cases."

Pure Water is Good Battery Insurance

by N. L. McMains, Jr.
Sales Manager

Reliance Battery Products Co.

"Water for servicing storage batteries should be of a high degree of purity for satisfactory service. Distilled water, therefore, is recommended where maximum efficiency and life of storage batteries are demanded. Rain water gathered from a non-metallic roof and stored in covered non-metallic containers is the next best battery water. Some natural waters contain so small an amount of impurities that they could safely be used in storage batteries.

"The majority of tap or well waters are not recommended. Impurities inserted into batteries with these waters are cumulative because the evaporation from the batteries is pure water only, leaving acid and impurities in the electrolyte. Batteries used in tractors, trucks and commercial cars which require frequent filling, will accumulate these impurities much faster than the battery in the family car."

END

(Please resume your reading on P. 34)

Power Boost



By substituting a Cummins NHB-600 engine in place of an HB-600, in a Kenworth tank truck, Williams Oil Co., Cortez, Colo., gained sufficient power to add a full trailer and step up the total payload from 5000 to 8000 gal

GM SETS NEW RECORDS

A record peacetime volume of production was achieved by General Motors in 1948, according to the corporation's annual report. Net sales were \$4,701,770,340 and net income was \$440,447,724, equivalent, after deducting dividends on the preferred stocks, to \$9.72 per share of common stock. While both sales and net income were at an all-time high in terms of dollars, net income represented a lower margin on sales than prewar—9.4 cents per dollar of sales in 1948 as against an average of 11.5 cents in 1936-1941.

Unit sales of cars and trucks produced by GM plants in the United States and

Canada in 1948 were exceeded only in the year 1941 and are summarized as follows:

Year	Passenger			Total
	Cars	Trucks		
1948	1,628,821	517,484		2,146,305
1947	1,503,046	427,872		1,930,918
1941	1,864,067	505,599		2,369,666

GM passenger car sales in 1948 were 40 per cent of the passenger car industry, the same as in 1947, and compare with 44 per cent in the 1936-1941 period. Chevrolet and GMC truck sales amounted to 35 per cent of the truck industry in 1948, compared with 32 per cent in 1947, and with 39 per cent in the 1936-1941 period.

NEAPCO 1500-1600 SERIES POWER TAKE-OFF JOINTS



For dump bodies, winches, road graders, farm equipment, etc.

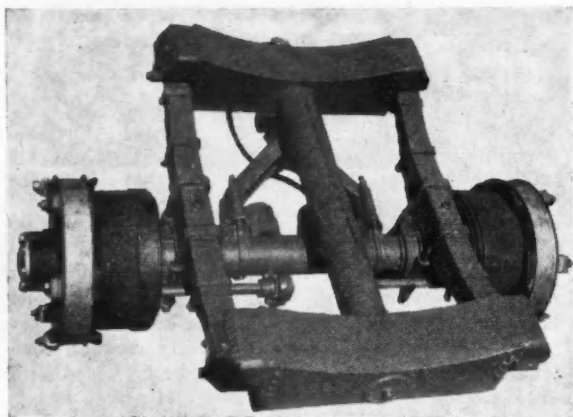
Selected as standard, original equipment by several leading manufacturers. Rugged, precision built. High torque capacity, long service life. End yokes solid forgings. For slow speed intermittent service—specify 1500 Series plain hardened steel bearing and bushing. For increased load and continuous service use 1600 Series needle roller bearings. 5 popular bore sizes are stocked by your Neapco Jobber. Other bore size combinations are available. He can order them for you.

See your Neapco Jobber for these fine PTO's.

Neapco Products Inc.



Pottstown, Pa.



TRUCKTOR

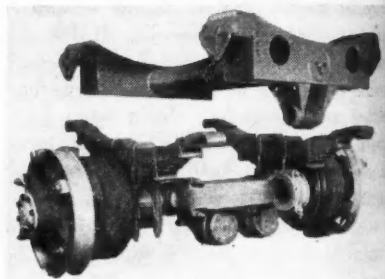
Single Axle Trailer Unit

▼ A NEW TYPE single axle trailer suspension unit, primarily designed for use with tank bodies, has been introduced by The Trucktor Corp., Newark, N. J. The photograph at left

shows the general construction featuring a cradle-type frame with tubular center piece which is used to stabilize the unit.

Unusually long life with remarkably little maintenance are features. Only four points (at each of the four spring shackles) need be lubricated once each 2000 miles.

When servicing is necessary, the photograph below illustrates the un-



usual ease with which the unit may be disassembled. The removing of four bolts, one at each corner of the frame, plus two bolts holding the yoke to a cross member under the frame does the trick.

Other features include long, easy-riding springs, riding in rubber at the axle. Several of the units are said to be already in operation among large eastern petroleum fleets.

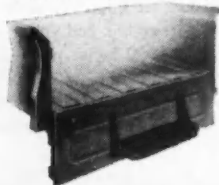


"And this one's for riding 500,000 miles in a truck—the order of the purple seat."

ask them:
"is your merchandise exposed?"

sell them
profit-protection with
CARAVAN TOP

DON'T JUMP!



STEP INTO YOUR PICKUP TRUCK!

New "Caravan" Folding Tail Gate Step saves time and energy, prevents accidents. Opens and closes automatically with tail gate. Heavy gauge steel. Quickly installed on any pickup.

A "Caravan Top" on your customer's pickup not only protects his merchandise against weather and profit loss, but gives him a better-looking truck, more useful for business and pleasure alike! The trimly tailored heavy duck cover and high-tensile aluminum alloy frame make a lightweight unit that one man can easily install or remove in minutes! "Caravan Top" has heavy duty slide fasteners, plastic window, adjustable tie-down. Cargo, Personnel, and Sportsman models for most sizes of pickup trucks. See your automotive jobber, or write us.

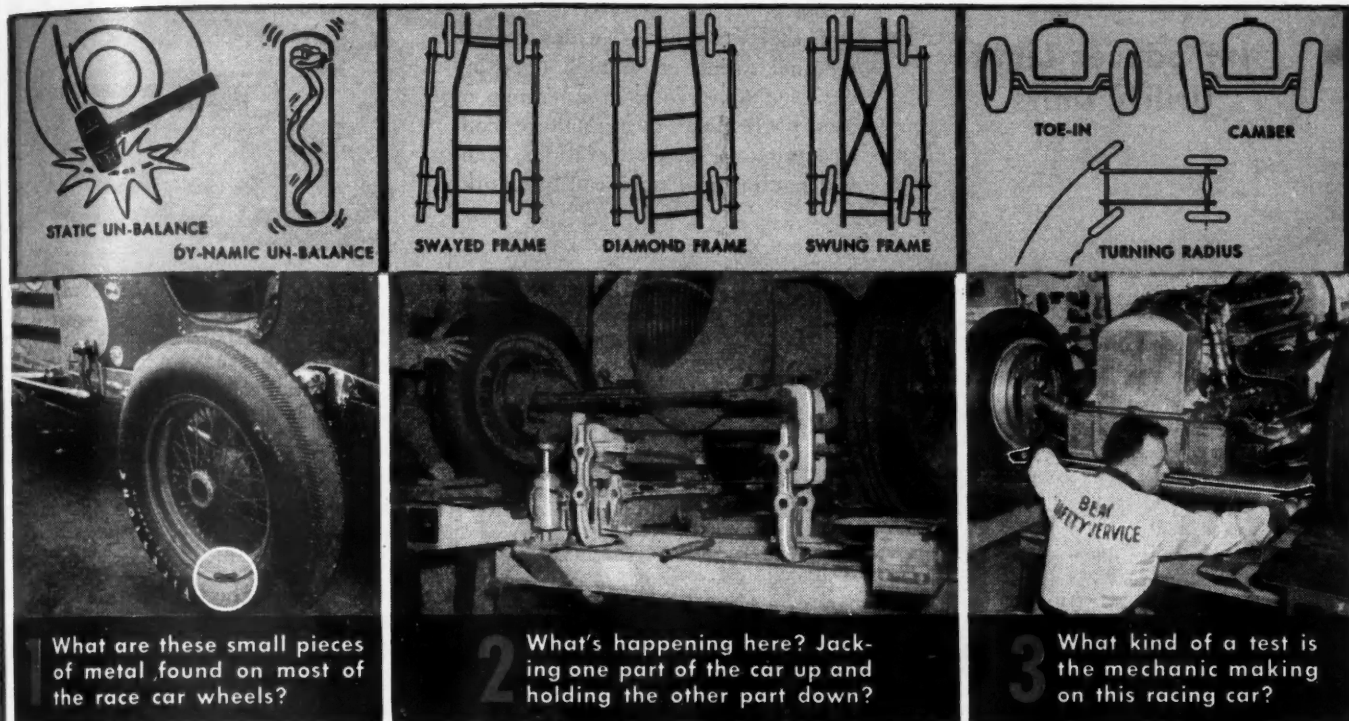


C. K. TURK CORP.

1122 Mishawaka Avenue • South Bend 15, Indiana

Listed as approved accessories by leading truck manufacturers

At the Indianapolis Speedway or on the Highway ... these Safety Tests are IMPORTANT! Do you know them?



1 The small pieces of metal you see on most of the race car wheels are proof that the wheels have been Dy-Namically Balanced. A few ounces of extra weight on one side of the wheel becomes a pounding force of 50, 60 or 70 pounds at high speeds. The weights counteract this unbalance which leads to excessive tire wear and dangerous blow outs.

2 The race car you see above is being adjusted on the Bear Frame Straightener. A bent or "diamond" frame can raise havoc with a car at high speeds. It causes hard steering, and excessive tire wear. Minor accidents, running into curbs, etc., often distort knees and frames just enough to cause serious riding difficulties. The Bear Mechanic can quickly straighten the frame to original specifications on the Bear Unit.

3 The mechanic is checking wheel alinement on a Bear Alinement Rack. Wheels must have just the right amount of camber, caster and toe-in for safe driving. Turning radius of each wheel must meet exact specifications so one wheel will not "drag" around sharp turns. All of the cars in this race must be perfectly alined before the race.

STEER
sure enough

SEE
fast enough

STOP
quick enough



**Join the thousands of Fleet Operators who enjoy
the TRIPLE PROTECTION of Bear Safety Service!**

Triple protection in the form of greater safety, longer tire life and lower maintenance costs is assured users of Bear Safety Service. Greater safety results when steering, headlight and brakes are Bear Tested and Corrected. Longer tire life is assured by Bear Wheel Alinement and Static and Dy-Namic Wheel Balancing. Bear eliminates the pounding, scuffing and scraping of expensive rubber from tires caused by mis-alinement and un-balance. Lower maintenance costs result when wearing vibration and looseness are eliminated by a thorough Bear Safety Check-up. Fleet Operators, regardless of size, can enjoy this triple protection. Whether you service your own equipment or send your equipment out for service, it will pay you to get the facts on Bear Safety Service TODAY! Write . . .

BEAR MFG. CO., DEPT. C-3, ROCK ISLAND, ILLINOIS

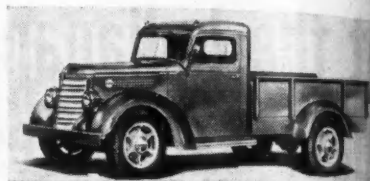
BEAR SAFETY SERVICE

FEDERAL

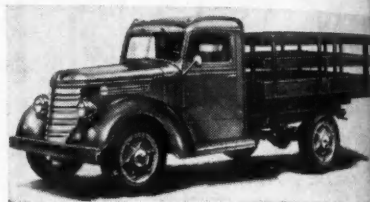
Introduces Light Utility Units

IN RESPONSE to a demand for light-duty utility units of rugged design and construction, the Federal Motor Truck Co. has announced Model 15M Utility Express and Stake trucks.

These two vehicles, which have a nominal rating of $\frac{3}{4}$ to 2 tons, are designed to serve a broad range of uses, particularly in agriculture, construction, oil field operations, general hauling and public utility work.



Federal Model 15M Utility Express



Federal Model 15M Utility Stake



...helps you overhaul any motor faster, easier and more profitably

Just ONE
'All-Point' stand
and ONE adapter
plate outfits you
completely

No extras to buy. Fits
popular car, truck and
tractor motors up to
1000 lbs.

Shows just a few of
the many adjust-
ments

Because the motor can be either barrel-rolled or turned end-for-end easily and quickly. Keeps work in the right position at all times, reducing fatigue and speeding production. For complete information on this labor-saving All-Point equipment, see your jobber or write
Montague Equipment Co., Troy, Ohio, U. S. A.

Spacers closed to the minimum give a circle of approximately 7" in diameter.

Spacers have been turned away from the Radial Arm giving added versatility and coverage.

Spacers extended to the full length of the Radial Arm give a circle of approximately 19 1/4" in diameter.

Should you work on only one type motor, plate can be set-up so that no change is needed between jobs.



They are powered by a 6-cyl. 245 cu in. Hercules engine which develops 93 hp at 3400 rpm and 184 lb-ft torque at 1400 rpm. The unit has a 7-main bearing crankshaft and both main and connecting rod bearings are copper lead.

Both the Express and Stake Units have 9 foot bodies with 135-in. wheelbases. Single front and rear tires, 6.50 x 20, with spoke wheels are standard with tires up to and including 7.50 x 20, as well as Budd Wheels available as optional equipment. Stake units are also obtainable with dual rear tires and wheels.

The Federal 15M Utility Express unit is equipped with a 450-pound heavy-duty all-steel body with 16-in. sides, 5-in. flares and double-acting tailgate. Other features of this unit include a heavy, all-steel corrugated floor unobstructed by wheel housings to provide full loading space, 8-in. skirts on both sides and end of body. The Express is also available with 15 1/2-in. or 29-in. side and end racks for agricultural use.

(TURN TO PAGE 250, PLEASE)



The Mileage Master comes in three sizes: 120, 135 and 150 gallons capacity, with overall lengths of only 27, 30 and 33 inches. The two main tanks are OB-Round and hug the frame closely. The tanks stay well inside the line of the tires. Has simpler-than-ever installation. No holes to drill nor is any welding necessary. Tanks are attached to truck frames by clamps and are adjusted to all frame widths. The Mileage Master is Underwriters' Laboratories Re-Examination Service Listed.

MILEAGE MASTER!

RELIEVES TORQUE

The two main tanks are completely separated. This not only relieves torque but makes it possible to replace either side in case of collision.

Like all other Prior sets, the Mileage Master comes equipped ready for installation of either electric or visual gauge. A cover plate, secured by six screws, can be removed and the desired gauge installed in a few minutes.

REG. U. S. PAT. OFF.



End-Fill OB-Round Tank has adjustable filler neck for under body mounting on any panel, stake or dump body truck.

MAIL TODAY

TO NEAREST ADDRESS

PRIOR PRODUCTS, Inc.

Box 349, Middletown, Ohio
Box 7608, Dallas, Texas

Please send me complete information on the Prior Mileage Master and the name of your nearest distributor.

Name _____
Street _____
City _____
State _____

Federal Utilities

Continued from Page 246

The Model 15M Utility Stake unit is equipped with a 650-pound Stake body measuring 108 x 78 in. The racks, which are 30 in. high, are easily removable. Other features of the stake body include an all-steel understructure, hardwood stake sections, rugged steel stakes and an

oak floor with interlocking skid strips.

The 15M is equipped with a 4-speed transmission and an 11 inch clutch having 131.4 sq in. of lining area which is unusually large for a truck of this size.

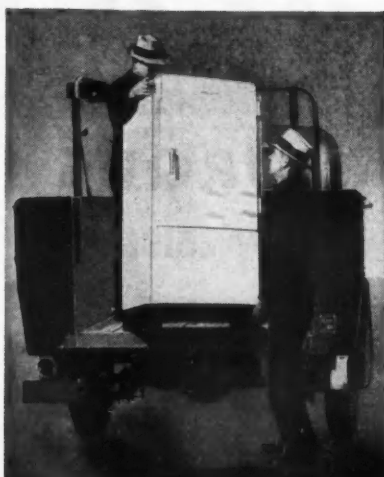
Timken wide track front and rear axles are supplied. A single speed spiral bevel rear axle is standard with a 2-speed axle available as optional equipment at extra cost. Over-size brakes have a 310 sq in. lining area, 4-speed transmission.

The 15M frame channel section is 8 9/16 in. by 2 7/8 in. x 1/4 in., well supported with ample cross members at critical points to withstand heavy-duty service. Front springs are 2 1/2 in. wide, rear springs, 3 in. wide with bronze-bushed eyes. Both "U" bolts and center bolts are alloy-steel heat treated to assure extra strength. The unit has anti-friction, triple tooth worm and roller type steering gear with an 18 in. hand wheel. A heavy channel front bumper is furnished as well as needle-bearing universals and large diameter propeller shaft, large packless type water pump and oil bath air cleaner.

Another distinctive feature is the outside 26-gal tank for greater safety and accessibility.

At Last! A LOW PRICED LIGHT-DUTY DELIVERY and SERVICE BODY!

➔ **Saves Man Hours Because It
Speeds Up Handling and Delivering!**



★ EFFICIENT
★ ECONOMICAL
★ LOW PRICED

ALL-STEEL welded construction - Roomy body for delivering large appliances - Weather-tight compartments on each side for tools, repair parts, replacement parts, etc. - Overhead ladder racks and other optional accessories available. - Designed for mounting on 1/2 ton, 3/4 to 1-ton chassis.



Write for descriptive bulletin today!

Parsons



ENGINEERING CORP.
2500 EAST 79th ST. CLEVELAND 4, OHIO

HEADS TRANSPORT DEPT.

Captain Granville Conway, for many years a government administrator of maritime activities, has been appointed Director of the Office of Transportation and Storage of the National Security Resources Board.

Deputy director of the Office is Admiral E. J. Moran, president of the Moran Towing and Transportation Company of New York.

Bum Fit!

The president of Fleety-Fleet Motor Express was dining with friends in one of the swank eateries. Upon paying the check he turned to the hook on which he had hung his overcoat, but found it empty. Rushing over to the manager he screamed, "I've been robbed. Someone has stolen my overcoat."

"What kind of a topcoat did you have?" asked the manager.

"It was a brown coat with raglan sleeves," replied the fleet operator.

"Hmmm," mused the manager, "Come to think of it, I saw a man walking out of here with that very coat on."

"Quick! Quick!" demanded the trucker. "What did the guy look like?"

The manager shook his head. "Terrible, terrible," he sighed, "the sleeves were too short for him."



"Shall I let her have it?"

Here's what you need to
Paint Trucks Faster, Better
at less cost!



DEVILBISS Complete Paint Shops...

Handle 3 to 5 trucks daily

Whatever your truck painting requirements, DeVilbiss can supply a Complete Paint Shop to handle the job better, faster at low cost. All of them are scientifically lighted and ventilated for maximum efficiency. They are equipped with the same highly perfected spray guns that are used on truck manufacturers' production lines. And specialized equipment for the very important jobs of touchup, underbody coating and stenciling is also included.

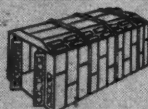
Every day more fleet operators are turning to DeVilbiss for complete paint shop modernization. DeVilbiss is headquarters for this modern equipment that gets painting done and trucks out on the road without delay.

THE DEVILBISS COMPANY • Toledo 1, Ohio
Canadian Plant: WINDSOR, ONTARIO

MADE TO WORK TOGETHER



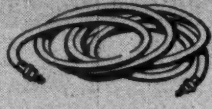
Spray Equipment



Spray Booths



Air Compressors



Hose and Connections

FOR BEST PAINTING RESULTS

DEVILBISS



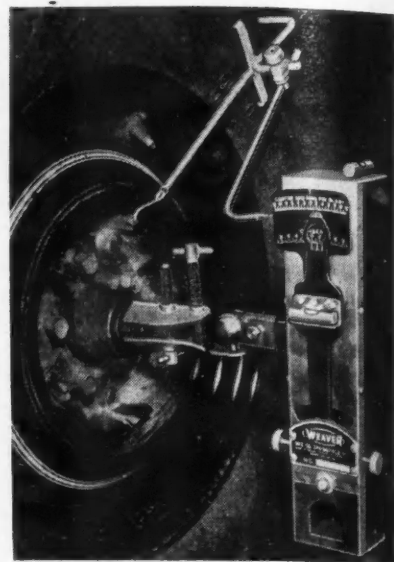
means Quality in all four...

SPRAY EQUIPMENT
EXHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS

Measuring and Adjusting - - -

Continued from Page 73

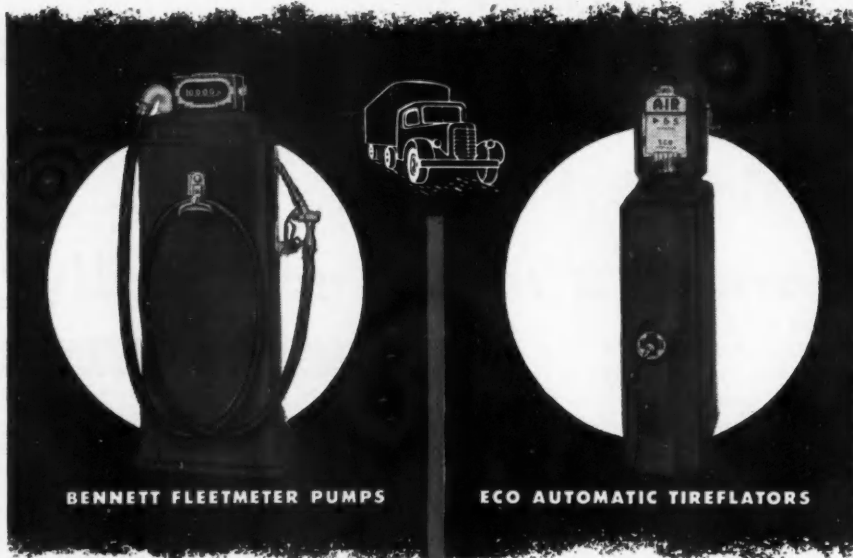
Balancing wheel and tire on static balancing machine with spirit level type instrument



This type of gage will measure camber, caster, and king pin slant. Unit is easily set up, accurate and can be read with a minimum of effort

SLASH

FLEET MAINTENANCE COSTS



Bennett Ticket Printer Fleetmeters, equipped with combined registers and ticket printers, deliver a printed receipt after each fuel delivery. This receipt provides an accurate accounting of fuel dispensed—protects against losses, eliminates errors!

Tickets or sales receipts are inserted in the printer and locked in by a turn of the crank. When fill is completed, another turn releases ticket. Two types of ticket printers are available—the "Accumulative" and the "Zero Start" systems. Four Fleetmeter models available—write for catalog.

Preventive tire maintenance systems demand correct pressures to start with, and Eco Tireflators, with their precision accuracy, provide exactly the tire pressures required.

Eco Tireflators offer proven accuracy through a full 5 to 110 pound service range, faster delivery for large truck tires and many other important design and construction features that save time, lengthen tire life and reduce on-the-road tire trouble! There's an Eco Tireflator model to meet every fleet shop requirement.

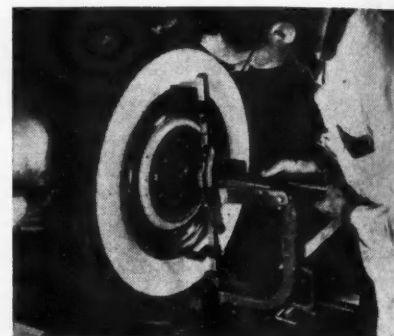
SERVICE STATION

JOHN WOOD Affiliate



EQUIPMENT COMPANY

MUSKEGON, MICHIGAN



This camber-caster gage is set up to measure camber. Easily-read dial is calibrated in degrees. Instrument will also check turning radius



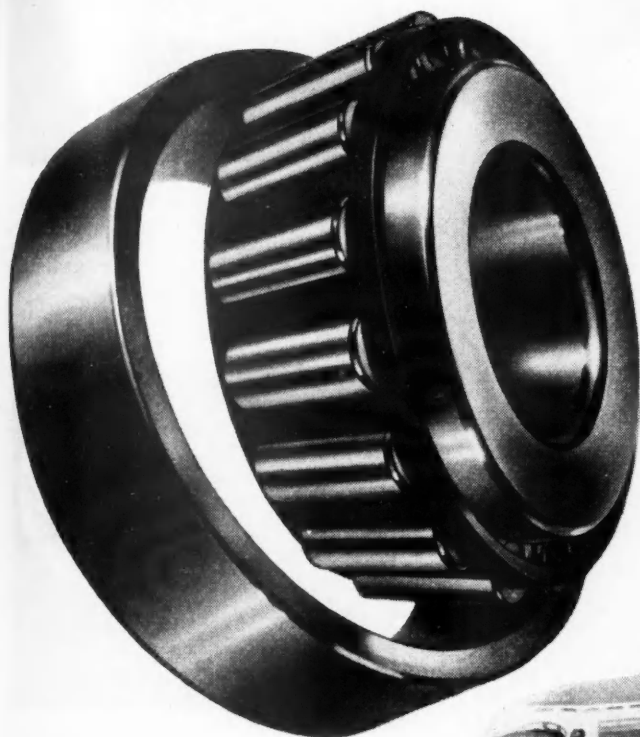
Checking tire and wheel for runout with tire scriber and manually-operated stand (TURN TO PAGE 254, PLEASE)

BOWER BEARINGS ARE



SPHER-O-HONED

FOR GREATER PRECISION . . . SMOOTHER PERFORMANCE



Ask any automotive engineer. He'll tell you that bearing precision and smoothness go hand in hand—that greater precision means smoother, more dependable performance.

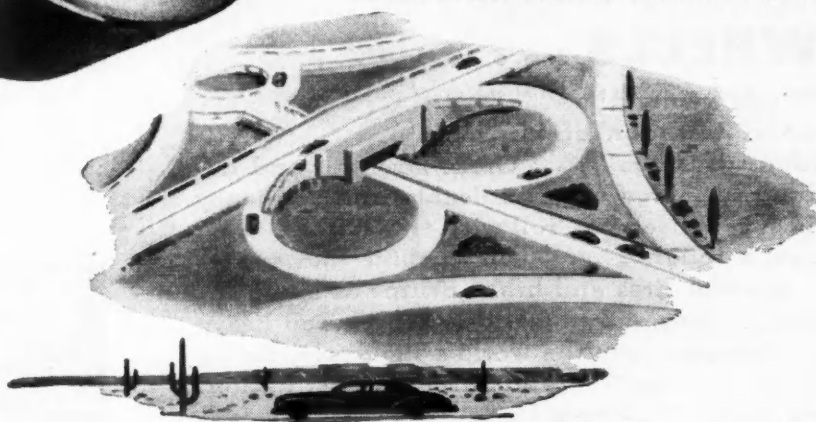
That's why the word SPHER-O-HONED is so important to you. It stands for significant design and engineering improvements—spherical roll-ends and cone flange, a large oil groove, and superior finish—that mean greater accuracy, less initial wear, better lubrication, and longer bearing life. It means lower installation costs too.

In many applications, Bower SPHER-O-HONED Bearings can be installed permanently—eliminating "running in" and costly "final" adjustment.

If you're looking for quiet, trouble-free bearing performance for your product, investigate Bower SPHER-O-HONED Bearings. They're your best bearing buy.

For more complete information, write for the new Bower engineering catalog.

BOWER ROLLER BEARING COMPANY • DETROIT 14, MICHIGAN



BOWER

ROLLER BEARINGS



HIGH IN THE TRADITION OF *Transport...*



ERIE WHEELS...

Erie Wheels typify the finest tradition of transport, "Safe Conduct of Cargo" . . . Great strength and dependability merge with malleable iron resiliency in Erie Wheels to "roll with the punch" when the going's rough . . . Their turbine-like spokes air-cool tires and brake drums as speed increases . . . Day and night, Erie Wheels roll heavy cargoes over the world's highways, Safely and Surely to Destination.

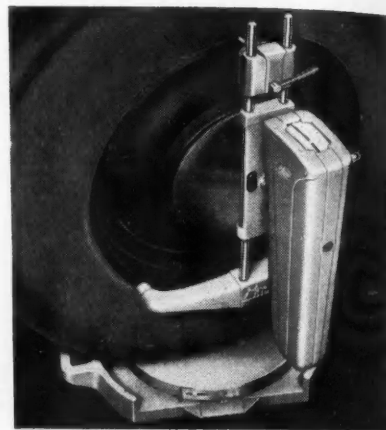


ERIE MALLEABLE IRON COMPANY

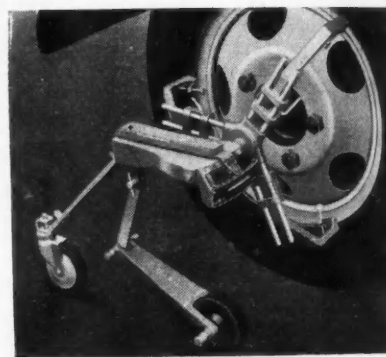
ERIE • PA,

Measuring and Adjusting - - -

Continued from Page 252



Check front wheel turning radius on a gage set up in this manner. Read turning angle on bottom scale and refer to manufacturers' specifications for correct setting



This type of camber-caster gage fits to wheel and shows alignment settings while vehicle is moving. Scale shows camber, caster and king pin inclination



Checking wheel balance on a dynamic wheel balancer. Light shows spots requiring weights

END

(Please resume your reading on P. 74)

NOW! A REALLY NEW ALUMINUM TRAILER



THE NEW "50"

TO MAKE MORE MONEY FOR YOU!

A shining new aluminum trailer — a rugged unit with enlarged load capacity! That's the Model "50" by Brown, America's first and foremost manufacturer of aluminum trailers and cargo vans. Displaying a host of brand new design features, as well as famous monocoque construction and other weight-saving advantages, the new Brown "50" gives you the dependable, big payload hauling service you want. Just check these features and see for yourself:

1—STRONGER SIDE PANELS: Double the number of corrugations. Five-inch corrugations provide 50% more resistance to buckling . . . stand up to hard driving with heavy loads. Extend trailer life.

2—NEW REAR FRAME: Lower rear frame sill creates a rugged bond between end plate and rear corner posts. Tough steel braces relay impact forces smoothly through the trailer skin. New corner post construction eliminates troublesome corner castings . . . prevents racking or distortion.

3—NEW FRONT END: Massive extruded wrap-around band replaces front corner castings. Increases strength 27%. Rugged steel wing plate protects band . . . allows wide-angle approach for tractor. New alloy corner caps give extra protection against low-hanging boughs . . . increase front end height for greater load capacity.

4—NEW LOWER LONGERON: One-part construction of this ribbed lower rail imparts extra strength to take smashing side swipes and dock bumps. Design simplifies replacing damaged side panels.

5—NEW KING PIN CONSTRUCTION: Box section seams are machine welded on the side. Fully penetrating, continuous

weld adds a bonus in strength. Skid plate of heavy-duty ¼-inch steel covers base and wraps around the front end, creating extra-rugged crash wings no other design can match.

6—NEW SIDE AND ROOF STIFFENERS: Rolled aluminum alloy stiffeners double resistance to localized stress failures. Present a 50% increase in buckling strength . . . give improved anchorage for side tie rings.

See your Brown distributor. He will be glad to tell you more about the feature-packed, profit-building new Brown Model "50." Write for new booklet 50 giving construction details of the new Brown "50."



"The Scale Tells the Tale"



ALUMINUM TRAILERS

BROWN TRAILERS, INC.

Box 54, Spokane, Washington — Box 873, Toledo, Ohio

Wear Limits

Continued from Page 66

Valve Stem to Guide Clearance

An old rule to follow is .00035 in. per .100 in. valve stem diameter, i.e., a valve stem having a .341 in. diameter should be fitted with approximately .0012 in. clearance. This would be the low limit and should not exceed .0022 in. Exhaust valve guide clearance should be approximately .0005 in. greater than intake.

Valve Guide Taper

Valve guide taper should not exceed .001 due to taper or uniform wear. Where design specifies a taper for the I.D. of the guide, would suggest that the above limit on wear be considered as the limiting factor.

Valve Springs

All valve springs should be checked on a spring tension tester. The compression should be within 10 per cent of the factory limit. If otherwise, replace.

Clearance

Valve tappet to bore clearance, +.002 from factory spec.

CLUTCHES

Information provided by Lipe-Railway Corp. and Spicer Mfg. Div. of Dana Corp.

Pressure Plate

Maximum free movement in driving slots, .015 in.; maximum fulcrum wear, 1/32 in.; maximum depth of scores which permit salvage by regrinding, 1/16 in.; maximum depth of scores permitting reinstallation without grinding, .005 in.; maximum out-of-flat permissible without regrinding, .007 in.

Pressure plates badly scored or dished in excess of 0.015 in. should be replaced. Driving lugs of new pressure plates must fit freely in the slots of the flywheel ring with a clearance of .004-.006 in.

If levers or lever fulcrum edges of adjusting plate and pressure plate show wear replace. Replace release sleeve if indented by release bearing. Always use new snap ring when rebuilding clutch.

Driven Plate

Replace if oil or grease on surface. Replace when worn to rivet heads. Replace if burned. Maximum play in disc splines measured at periphery, 1/8 in. if excessive spline wear occurs, check alignment between transmission and engine. Maximum free play at periphery due to damper parts, 1/16 in. (Scrap disc if more.) Permissible warpage: (Use indicator) face runout, .010 in.

Cover (Flywheel Ring)

Maximum total freedom of pressure plate in slots, .015 in.

Release Bearing

Grease, High Temperature B.&RB. Adjustment—by turning castellated adjusting ring to correct free pedal travel.

Clutch Release Shaft

Maximum play in bushings, .015 in.

Two-Plate Clutch

Same instructions as above apply plus following additions: Intermediate Drive Plate. Clearance on drive pins, as measured by peripheral play, .009 in. Scoring—maximum permitted same as pressure plate. Out-of-Flat—maximum permitted same as pressure plate.

SERVICE BRAKES

Information provided by U. S. Asbestos Div. of Raybestos-Manhattan, Inc., and Thermoid Co.

The following working limits for better operation and care of Lockheed, Huck, Bendix and Two-shoe cam operated brakes, are recommended:

Brake Drums

Do not cut drum wall on cars, light trucks, heavy trucks and busses more than 20-25 per cent of manufacturer's original thickness. Thickness refers to drum body only and does not include flanges or ribs. Drums should be discarded if deflection in diameter is more than .060 in. under full brake application. Diameter should be concentric with hub within .010 in.

SURFACE—Refinish if heat checked or scored more than .010 in. deep.

TAPER—Refinish if barrel shaped or bell-mouthed more than .010 in.

SHIM STOCK or oversize lining should be used to compensate for material removed from drums.

Brake Shoes

ANCHOR ENDS—Bendix shoes should be repaired or replaced if anchor radius is enlarged or bent.

RIM—Shoes should be repaired or replaced if rim is out of round, out of square or distorted.

WEB—Shoes should be repaired or replaced if rim to web weld is broken as this causes excessive rim flexing resulting in uneven lining wear.

CAM ENDS—Bendix shoes should be repaired (or discarded if this is not possible), if the cam end is worn or bent and if the anchor pin eye is worn at the small radius.

ROLLERS—Discard rollers that are worn, particularly if a flat spot is present on outside. Discard cam follower plates if grooved by the cam more than .015 in.

Bushings

ANCHOR BUSHINGS should be replaced if worn more than .008 in. Anchors should be fitted and bushings accurately reamed.

Anchors

PINS: Anchor pin on the Huck brake is non-adjustable type, renew anchor if worn more than .008 in. On the two-shoe cam operated brake and the Lockheed brake, renew anchor pins, or rebush shoes if worn more than .008 in.

Links

ARTICULATING LINKS must be rigid and hold the shoes without side play. Examine buttons and button springs and renew if bent or worn. Applies to Huck brake only.

Springs

All weak pull back springs should be replaced.

Cam

On the two-shoe cam operated brake, camshaft should be renewed and bracket rebushed if worn more than .025 in.

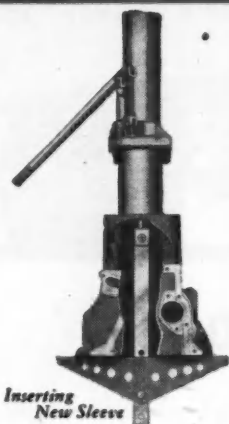
(TURN TO PAGE 258, PLEASE)

**TOUGHEST JOB
IN THE SHOP
KNOCKED OUT!**



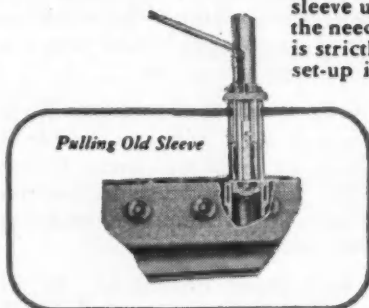
... by the NEW

ACCURATE HYDRAULIC SLEEVE-MASTER for Pulling and Installing CYLINDER SLEEVES in all Sleeve-type Motors



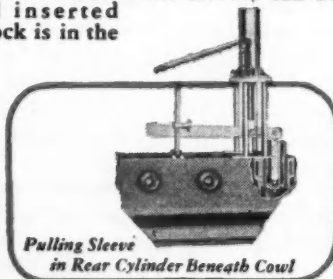
Inserting
New Sleeve

No sleeve too tough or too stubborn! The ACCURATE SLEEVE-MASTER is designed to pull or install any sleeve up to 5½" O.D. and up to 11" in length without the need for raising blocks. The new SLEEVE-MASTER is strictly a one-man operation and permits simple, fast set-up in each cylinder.



Pulling Old Sleeve

The complete pulling and replacement job is a matter of only 1½ hours at the most. No need to lift the motor out! All sleeves can be pulled and inserted while the block is in the chassis.



Pulling Sleeve
in Rear Cylinder Beneath Cowling

The SLEEVE-MASTER is powered with a 25,000 lb. hydraulic cylinder and is equipped with a two-stage pump which gives maximum pulling power for breaking "frozen" sleeves loose; then permits fast extraction when second stage of the pump is engaged.

It will pay its way in any shop. Write for complete information.

ACCURATE TOOL AND GAGE CO.

216 SECOND AVENUE SOUTH, MINNEAPOLIS 2, MINNESOTA

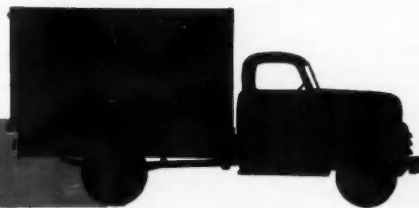
"REGULAR" SERIES: An all-purpose lining recommended for mechanical and hydraulic brakes.

For safer stops—



"1,000" SERIES: Engineered primarily for longer life with powerful vacuum booster systems. Also for air brakes where there is need for faster action than is provided by "2,000" Series.

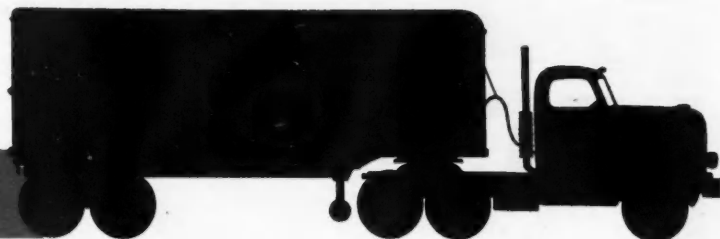
and more of them—



"2,000" SERIES: For maximum mileage and efficiency under extreme conditions with air brakes or powerful vacuum systems.

"C" SERIES: Thick blocks for air brakes or powerful vacuum systems.

use the axle groups



"Friction-Engineered" FOR YOUR EQUIPMENT

● On any equipment, under all conditions, you get safer stops—and *more of them*—with the correct American Brakeblok axle groups on your brakes.

Each American Brakeblok group is "friction-engineered" for the braking system on which you install it. It provides the exact combination of frictional and wear characteristics that your truck requires. Result: you get smooth, sure stops every time, with fewer adjustments and less maintenance.



American Brakeblok is distributed through 38 NAPA Warehouses, helping jobbers everywhere give prompt, complete service.

AMERICAN
Brake Shoe

COMPANY

Across America, "friction-engineered" groups and sets are the No. 1 choice of leading fleets. Use them on *your* fleet. Give your American Brakeblok Jobber complete data on your vehicles, and he will supply you with the "friction-engineered" sets you need to keep them stopping *safely—at lowest cost.*

American
REG. U.S. PAT. OFF.
Brakeblok
BRAKE LINING

AMERICAN BRAKEBLOK DIVISION
DETROIT 9, MICHIGAN

Wear Limits

Continued from Page 256

Backing Plate

Repair or replace warped, bent or loose backing plates. Lubricate backing plate ledges.

Hydraulic Systems

WHEEL CYLINDERS—Dismantle and examine at each reline or if leaks are present. Renew pistons if scored, sticking or worn more than .005 in. Cylinder walls should be honed if scored. If, after honing enough to remove all scores, the "no-go gauge" will enter, wheel cylinder should be replaced. Renew all rubber cups.

Master Cylinders

CHECK VALVE—Residual line pressure should be 7 to 12 lbs. per sq. in. Renew check valve if spring

is rusty or seats are worn in spring type, or if rubber cup or rubber seat are worn or distorted in metal cage type.

PRIMARY AND SECONDARY CUPS—Replace cups if distorted or edges are rounded.

MAIN SPRING—Replace spring if weak or rusty.

PISTON—Renew if scored or worn more than .005

Make sure ports and filler cup vents are open.

CYLINDER WALLS should be honed if scored. If, after honing enough to remove all scores, the "no-go gauge" will enter, master cylinder should be replaced.

Brake Lining

LINING should be replaced when worn within .010 in. of rivet head on passenger cars and light trucks and within 1/32 in. of bolt head on heavy trucks and buses. In the case of bonded linings, which are rapidly coming into the picture, lining should be replaced when worn to a minimum of .015 in.

END

(Please resume your reading on P. 67)

Braking Distances

(CONTINUED FROM PAGE 118)

Power Braking

Power braking, applying power without accelerating with the right foot while the left foot actuates the brake pedal, reduced braking distances for a four-wheel drive truck equipped with hydraulic brakes actuated by a vacuum booster. With this truck empty, locked-wheel stops averaged 299 ft at a temperature of 32 deg F compared with a power braking average of 261 ft, a reduction of 13 ft. Locked-wheel stops averaged 313 ft with this same truck in full load condition at a temperature of 22 deg F, while power braking produced an average braking distance of 246 ft, a 21 per cent reduction. On the other hand, tests with a standard truck equipped with air brakes showed no appreciable difference in braking distances.

Front Brake Tests

The first report by the Joint Committee of 1948 Winter Traction Tests showed the value of front wheel brakes under certain conditions, but amassed considerable evidence against the requirement that front wheel brakes be used on all commercial vehicles at all times. A loaded 3-axle straight truck and all of the combination vehicles tested on ice could stop on the glare ice curve in a shorter distance when the front wheel brakes were off. There were definite indications that the test vehicles could not be controlled on the curve with the front wheel brakes in operation as well as they could with the front brakes disconnected. The 4-axle truck full combination equipped with air-mechanical brakes could stop on dry, level concrete straightaway in almost as short a distance with front wheel brakes disconnected. All of the vehicles could stop, without losing steering control, on dry level straightaway and the glare ice straightaway in a shorter distance when the front panel brakes were on. The 2-axle straight trucks could stop, without losing steering control, on either dry pavement or glare ice in an appreciably shorter distance when the front wheel brakes were on.

END

(Please resume your reading on P. 119)

ALGER AWARDS THE BOSS

The Geo. F. Alger Co., Detroit, has had many a champion truck driver. Now the shoe is on the other foot as employees last month awarded President A. C. Scott a trophy inscribed: "To A. C. Scott, a Champion of 28 Years for Leadership and Progress."



TRAINOR

ALL STEEL HELPER SPRINGS

give you a stabilized, increased payload capacity. The Steel Springs are engineered for simple installation and all attaching parts made of spring steel without breakable castings. Trainor Springs are constructed to carry even greater loads than their specified capacity. One trip often pays for the cost... a small investment that pays big dividends.

TRAINOR BUILD-UP KITS, for use on trucks 1 1/2 ton and up, reinforce original main and helper springs. Each leaf is properly arched to give the assembly maximum strength at minimum overall weight. Extra long U Bolts, Rebound Clips and Center Bolts are supplied for complete installation. Any mechanic can install Trainor Build-Up Kits quickly and easily with ordinary garage tools.

If your automotive wholesaler or spring specialist cannot supply you with Trainor Products, write for complete information. State year, make and model of truck to be serviced.

**TRAINOR NATIONAL
SPRING COMPANY
NEWCASTLE, INDIANA**

Here is One Result!



It's the new Model 5-A-1120 Fuller Transmission . . . designed especially for use with the largest automotive engines and in the largest trucks built for both on and off-highway operation.

This Model 5-A-1120 Fuller Transmisson meets your demands for helical gearing in all the forward speeds, short shifts, three-point bearing suspension for the mainshaft and oversize ball and roller bearings in all positions.

You wrote these specifications, Mr. Owner, Driver and Mechanic—here is the result:

Model 5-A-1120

GEAR RATIOS	STANDARD	OPTIONAL	VEHICLE ROAD SPEED—MPH (Axle Ratio—4.16-1) (Tire Size—10.00-22)
*Fifth	.744	.634	61.7
*Fourth	1.00		46.6
*Third	1.76		46.0
*Second	3.27	3.08	34.7
*First	4.54		26.1
Reverse	6.49	5.06	22.4
*Helical-Type Gearing			
Maximum Engine Size			Approx. 1120 Cu. In.
Weight with Standard Controls			681 lbs.
Installation Dimension			31 7/32"
Clutch Front end arranged for assembly of either standard single or two-plate push type clutches.			
Rear Mounting Four studs assembled in the rear face of the transmission case for the attachment of an additional support.			
Clutch Housing SAE No. 1 or No. 2.			

Fuller Builds Transmissions for Trucks from Two Tons to the Biggest

FULLER MANUFACTURING COMPANY • Transmission Division • Kalamazoo 13F, Michigan

Bad Driving Practices

Continued from Page 123

fication of such offending drivers.

Another prevalent practice is for drivers who have been ill during the night or are suffering from tooth or ear trouble, acute or chronic, to persist in driving their regular runs. Toxic infection frequently results from chronic tooth trouble which sometimes induces a state of torpor and which reduces the driver's alertness and causes drowsiness and may even result in his falling asleep.

What might be considered as a general practice throughout most of the trucking industry is that of the carriers who exercise very little judgment and no energy in attempting to keep informed as to their drivers' physical and mental conditions. They often dispatch drivers who have no business being at the wheel due to various types of fatigue mentioned above and then express amazement and lack of understanding as to why their accident records are becoming progressively worse.

Mechanical Defects

NOR are drivers completely free of the responsibility for accidents caused by mechanical defects, despite the fact that there exists a generally held theory that disabled vehicles are the responsibility of the maintenance department and drivers can do little to avoid accidents of this type. However, a brief analysis of the nature and causes of such accidents will serve to show that the driver is not the least, but the most, likely person who could have avoided them. The driver's responsibility is two-fold. What could he have done to prevent the vehicle from becoming disabled and what could he have done to prevent the accident when the disablement occurred?

While it is not expected that drivers should be expert mechanics, they are required to be competent and no driver is competent unless he can satisfactorily perform the inspections required by the driving regulations.

Few, if any, drivers are incapable of making the required inspections but there is considerable failure on the part of drivers in making such inspections or even if they do so in ignoring the discovered defects.

Let us assume that a driver has been sufficiently observant to discover a dangerous defect and either by luck or skilled driving has returned safely to his terminal. Are his duties completed? No, the regulations require that he turn in a written report setting out the nature of the defect. In addition, he should carefully check the vehicle before taking it out again to make certain that the defect has been repaired.

Despite all precautions which have—or should have—been taken, let us suppose that a vehicle has a mechanical failure. If the failure is of a type which is progressive and gives forewarning, such as an engine overheating, the driver should park at the first place where he can get the vehicle off the highway. Let him not attempt to "limp to town" and subsequently become totally disabled entirely on the highway.

(TURN TO PAGE 264, PLEASE)



perfect control
BLUE STREAK
cutouts

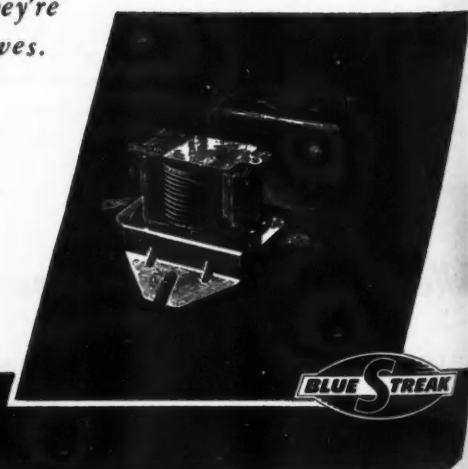
Blue Streak cutouts are a saving from the word go. They're easier on your generators; they last longer themselves.

- Heavy magnetic pull prevents chatter.
- They de-magnetize quickly.
- Points open and close with a snap, so there is a minimum of point burning.

These are exclusive Blue Streak features which make the Blue Streak cutouts more efficient and more economical all the way. Try them, and save!

STANDARD MOTOR PRODUCTS, INC.

Long Island City 1, New York



HOW YORK-HOOVER BODIES

help cut your DELIVERY COSTS



REASONS WHY *

1. All-metal body structure is balanced to produce minimum weight.
2. Exclusive body framework and assembly details result in many extra years of service.
3. Construction includes replacement parts study for maintenance economy.
4. Details of convenience for driver and garage personnel carefully considered.
5. Your body is engineered for your specific job — and yours alone.

Year after year new customers discover what old customers have already learned—that York-Hoover's 57 years' experience, plus sound engineering and honest workmanship, produces truck bodies that do the job better. If your problem is to cut your "per package" delivery cost, it will pay you to get the York-Hoover story . . . Now!



YORK,

YORK-HOOVER BODY DIVISION CORPORATION



PENNSYLVANIA

Bad Driving Practices

Continued from Page 262

Breakdown Precautions

LET us now charitably assume that the carrier and the driver have done everything possible to avoid the breakdown. There are still going to be vehicles parked on the highway or the shoulders because of mechanical failures. What can the driver

do in such cases to avoid an accident? In the first place, get as far off the highway as possible. Immediately, thereafter, and the word *immediately* cannot be too strongly over-emphasized, he should properly place his emergency equipment. Don't take the time to light pot torches first if the unit is equipped with these devices. Place a lighted fusee on the roadway at the traffic side of the vehicle at once. If other protective devices, such as electric lanterns or reflector flares are used, they too should be promptly

and properly placed. Placement, as well as time, is important. Give adequate advance notice especially when the unit is disabled on a curve or hill. Don't crowd the devices around the unit. It takes time for an approaching driver to see, recognize, and take the proper steps necessary to avoid a parked vehicle. Too often if all the protective devices are crowded around the unit, they are all "blotted out" by the headlights of a vehicle coming from the opposite direction. Proper spacing will avoid this. Drivers should never assume that an unknown defect which disables their vehicle is minor in nature and readily repairable and for that reason, they need not go to the trouble of protecting their equipment. In such cases, they might well hope for the best but they should prepare for the worst by taking the precautions called for by a long stop.

In 1947 there were more than 1300 mechanical defect accidents reported to the Commission by motor carriers, of which a substantial proportion were of such character as to cause vehicles to be stalled on highways. As compared to an equal number of other mechanical defect accidents, the "stalled vehicle" type resulted in four times as many fatalities. From this it follows as a fair inference, that such accidents are four times as likely to result in fatalities.

Defensive Driving

SUMMING UP, I am firmly convinced that many accidents could be prevented and lives saved if drivers would practice defensive driving. In other words, be sure that their own actions or movements are safe rather than to depend on someone else. Not only do we need to uncover bad driving habits, but we must counteract them with the doctrine of driving to prevent accidents.

Taking it by and large, all of those things which drivers habitually "do which they ought not to have done, or leave undone which they ought to have done" are bad driving habits.

END

(Please resume your reading on P. 124)

M. D. MAREMONT DIES

Myer D. Maremont, chairman of the board of directors of Maremont Automotive Products, Inc., Chicago, died March 8 at the age of 77, after a brief illness.

AUTOMATICALLY SELF-CANCELLING



DIRECTION SIGNAL SWITCH

GROTE
DIRECTION
LAMPS ARE
BRIGHTER,
STURDIER

Automatic and positive, the Grote Signal Switch returns to neutral promptly when the turn is completed. The same mechanical principle, the same safety and convenience of direction-light control as used on the finest cars is now available for trucks and buses, either as a switch replacement, or as part of a complete set of Grote's high visibility signal lamps. See these new lamps with Grote's brighter, molded plastic lenses. Compare them for brightness — for durability — for greater safety at every turn.



Pioneers in
PLASTIC AUTOMOTIVE LENSES AND REFLECTORS

Names that keep your wheels rolling

—backed by the promptest, most complete
service of supply available anywhere

These are the names of parts and supplies
—for cars, trucks and buses of *all* makes
and *all* ages—available to you from your
NAPA Jobber. Many of them you will recog-
nize as original equipment on your fleet, or
on vehicles like your own. In every case, all
these nationally known brands are recog-
nized by automotive engineers as meeting the
highest standards of genuine quality.

From his own stocks of these fine parts,
your NAPA Jobber is prepared to meet the
vast majority of your normal requirements.
In emergencies involving parts usually avail-
able only from distant factories, your NAPA

Jobber can come to the rescue *promptly* by
drawing on master stocks in the nearby
NAPA Warehouse.

Whatever your parts requirements—nor-
mal, unusual or both—your NAPA Jobber is
in position to give you an unparalleled supply
service on genuine quality parts, backed by
the largest independent organization in the
parts industry. If you haven't closely exam-
ined the advantages of consolidating your
parts purchases with your NAPA Jobber, call
on him now. Let him explain in detail how
he can save you time, money and headaches
on every parts purchase.

NATIONAL AUTOMOTIVE PARTS ASSOCIATION • DETROIT 1, MICHIGAN

N.A.P.A.

is the largest Independent Parts Organization in the Industry!





**A BIG GAME HUNTER
NEEDS SPECIAL EQUIPMENT**

YOUR CARS AND TRUCKS NEED PURITAN Super 60 BRAKE FLUID

We're not telling you anything when we say that commercial car service is in no way comparable to passenger car usage. But we can tell you that Puritan Super 60 Brake Fluid was developed to more than meet the demands of the heavy duty service that trucks and commercial cars experience.

Especially compounded from organic materials, Puritan Super 60 Brake Fluid surpasses every specification you would set up for a brake fluid for this severe duty.

BOILING POINT 370°F: No danger of brake failure due to vaporization.

FOUR POINT 60°F BELOW ZERO: Remains free flowing and mobile even in Arctic weather.

NON-GUMMING AND NON-OXIDIZING: Has a special base that does not gum or oxidize under any operating conditions.

MOISTURE ABSORPTION: Capable of absorbing all moisture of condensation—thus protecting wheel cylinders and metal parts against corrosion.

INERT TO RUBBER: Does not cause rubber cups to swell or deteriorate.

MISCIBLE: Mixes completely with all existing brake fluids made with castor oil, glycerine or synthetic base.

To play fair with your commercial cars and trucks you should use a brake fluid that is made exclusively for them. The use of Puritan Super 60 Brake Fluid, will pay off in dependable, trouble-free hydraulic brake operation and longer periods between servicing. Start getting the benefits of this superior "miscible" brake fluid by adding it whenever a shot is required. Better still get your cars and trucks off to a clean start by flushing the brake system with Puritan Hydraulic Brake Flushing Fluid and a complete refill job with Puritan Super 60 Brake Fluid. Your N.A.P.A. jobber can fill your needs today.



In Canada: F. R. RUSSELL
37 Croydon Rd., Toronto 10, Ontario

PURITAN COMPANY, INC.
ROCHESTER 6, NEW YORK

HYDRAULIC BRAKE FLUID AND FLUSHING FLUID • GASKET SEAL NO. 1, 2 AND 3
SHOCK AND KNEE-ACTION OIL



How to Wash - - -

Continued from Page 82

Trucks are washed twice a week, the ones with light colors, three times.

In a similar but not clear-coated fleet in the same city, where 200 beer trucks are stored in the yard, three good men and a shifter can do only 20 per night shift, on a stand equipped with a shower. Annual costs per truck: About \$50 for wages, \$5 for cleaner. They get washed once in two weeks, except in freezing weather.

In small garages it is customary that a lone washer cleans one truck per hour, big or little. That comes, at one wash per week, to about \$62 for wages and \$7.50 for cleaner per truck per year.

Tank trucks (oil) washed once a month: Two in 8 man-hours. Annual wages per truck: About \$70, cleaner about \$16.

A fleet of 200 beautiful buses, fully garaged, is fountain-brushed by five men (plus three shifters) every night without any cleaner. Then each bus receives a daytime scrub job with soap once a month inside and out—2½ men inside, 2½ men outside, one shifter. Annual expense per bus: About \$200 for labor, \$5 for soap.

Another good-looking, though yardstored, fleet of 200 buses is soaped and run through rotary brushes three nights a week except in freezing weather. There is a foreman, two washers and three shifters. The shifter jumps out on the wash stand and helps scrubbing. This is fast production. Insides are periodically cleaned by a daytime crew—perhaps 25 man-hours per bus per year not including the daily sweeping.

(TURN TO PAGE 270, PLEASE)



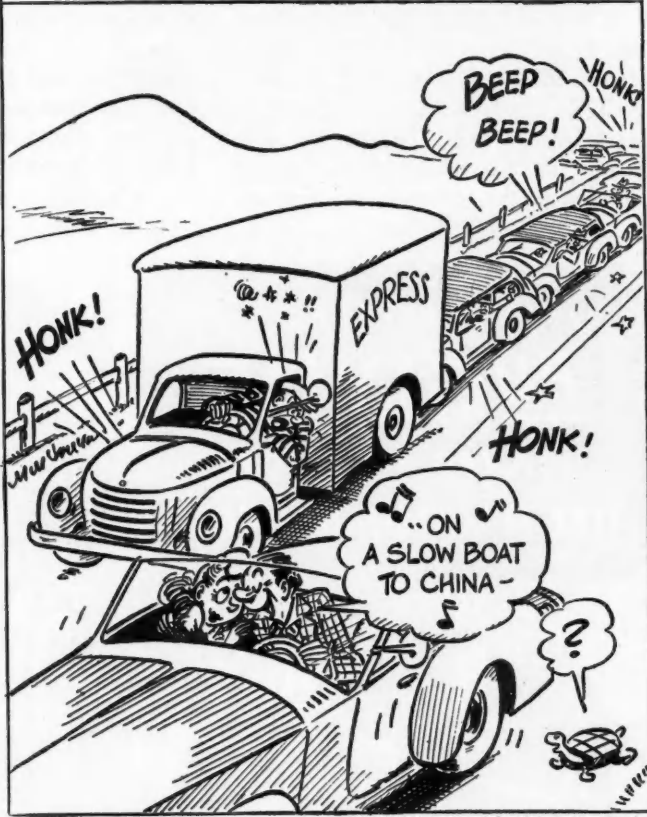
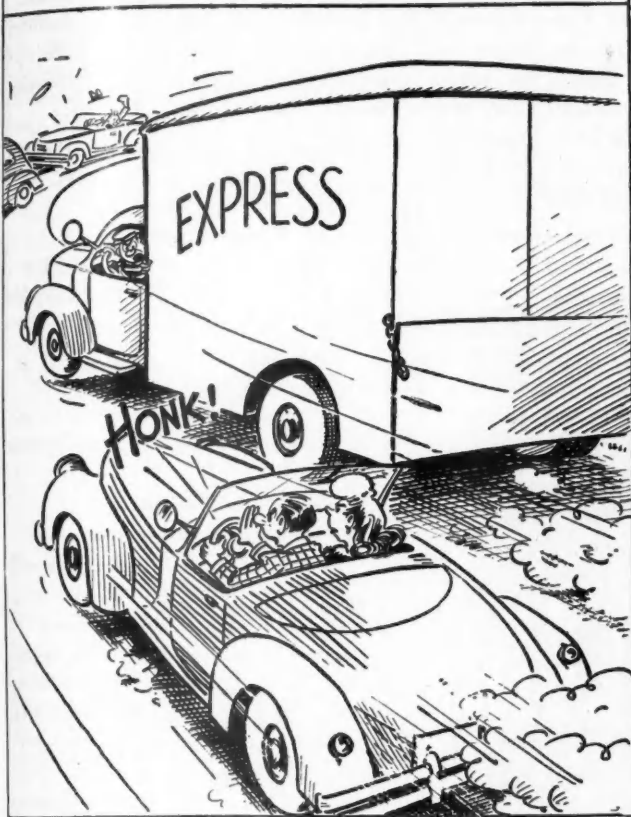
"—And that brings you right back on the turnpike again."

"THEY NEVER MISS ...!"

by Gum

WHY IS IT? THE ERK-JAY WHO JUST HAS TO GET BY YOU IN SUCH A HURRY—

SLOWS DOWN TO A FUNERAL PACE ONCE HE REACHES THE HEAD OF THE LINE—



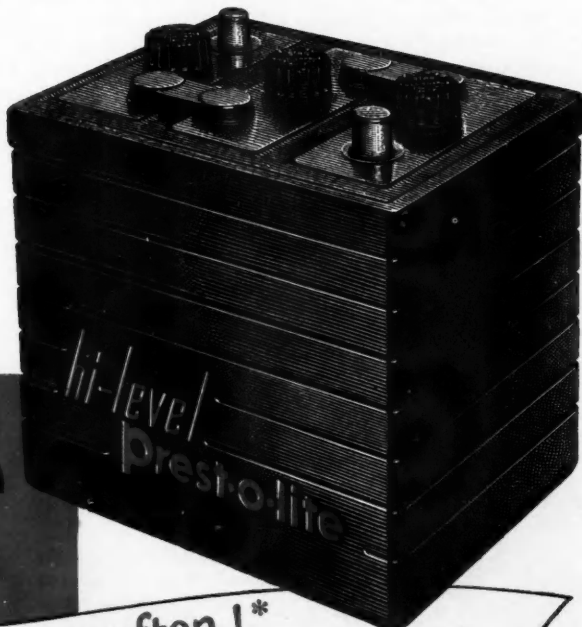
Copyright 1949, Prest-O-Lite Battery Company, Inc.

Hi-level saves you trouble...

Fleet owners are invited to investigate the many advantages of Prest-O-Lite Hi-Level, the battery that needs water only 1/3* as often. The sensational Hi-Level principle helps keep plates fully covered for fast, sure starts. Service time is reduced, batteries last longer, too. Look ahead and help keep your fleet rolling on schedule by replacing with Hi-Level Batteries. See your distributor or write to

PREST-O-LITE BATTERY COMPANY, INC.
Toledo 1 • Ohio

prest-o-lite
hi-level battery



... needs water only 1/3 as often!*

Song Courtesy Susan Publications, Inc.

*As Batteries without the Hi-Level features



**A BIG GAME HUNTER
NEEDS SPECIAL EQUIPMENT**

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How to Wash - - -

Continued from Page 82

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(TURN TO PAGE 270, PLEASE)



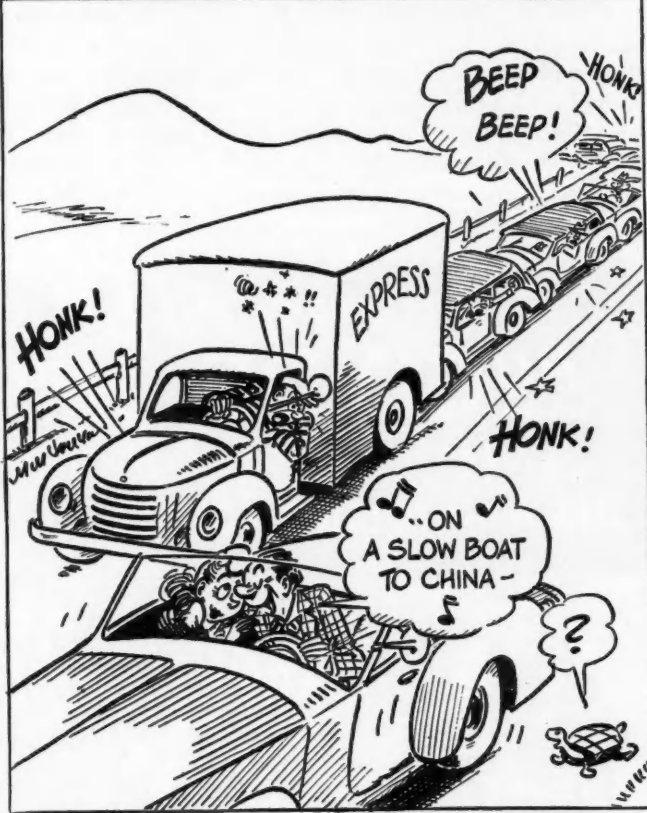
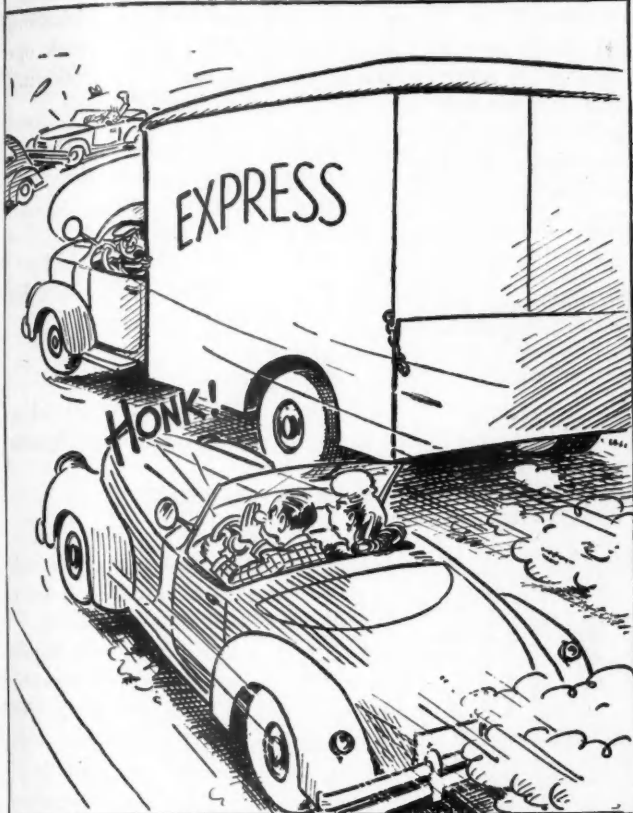
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by Gum

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SLOWS DOWN TO A FUNERAL PACE ONCE HE REACHES THE HEAD OF THE LINE—



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PREST-O-LITE BATTERY COMPANY, INC.

Toledo 1

Ohio



prest-o-lite
hi-level battery

... needs water only 1/3 as often!*

Song Courtesy Susan Publications, Inc.

*As Batteries without the Hi-Level features

How to Wash - - -

Continued from Page 268

Annual washing expense per bus: about \$107 for wages, and \$7.50 for soap.

A fleet of 100-200 trackless trolleys can be put through a modern wash stand with two sets of rotary brushes easily in 8 hours, requiring 2-3 shifters. Once a week the coaches also receive an automatic spray of soap solution at the entrance and a front

and rear brushing with soap solution by hand (2 washers). Results are excellent at annual cost per coach of about \$60.00 for wages, \$14.00 for soap, plus \$30.00 for amortization of construction and equipment (20 yd). Spraying of soap solution (it works only with very fine cleaners) not only saves time but also improves results because the cleaner is automatically given time to soften the dirt before brushing. While fountain brushes are heavy and unpopular with the help, they are, in the absence of rotary

brushes, by far the most efficient means of brushing and rinsing. If the vehicles have been soaped, it is important to brush from the bottom up and to turn the water down to a sparse flow so as not to wash away the cleaner before proper agitation.

In setting up his vehicle cleaning program, the commercial vehicle operator must consider the following essentials as they apply to him:

1. Standard of Appearance Desired
 - (a) Frequency of washes
 - (b) Quality of washes
 - (c) Expense warranted
2. Number and Size of Vehicles
3. Type of Finish on His Vehicles
 - (a) Enamel or Lacquer
 - (b) Waxed
 - (c) Color
4. Type of Cleaning Material to Use
5. Washing Equipment and System Needed
6. Manpower Required
7. Supervision and Control

It is my hope that this paper will be of assistance to commercial operators in answering these questions.

I wish to acknowledge with appreciation the help received in preparing this paper by the members of the SAE committee and especially the very helpful information received from leading commercial fleet operators and leading manufacturers of auto finishes, cleaning materials and washing equipment.

END

(Please resume your reading on P. 83)

AVERAGE CAR 9.3 YEARS OLD; TRUCK 8.0 YEARS

As of Dec. 31, 1948, the average age of passenger cars on the nation's highways was 9.3 years and of trucks 8.0 years, according to R. L. Polk & Co. The average mileage on the nation's automobiles is about 65,000 miles, on the supposition that the average car owner drives 7000 miles a year.

Statisticians have pointed out that in spite of the fact that 4,500,000 new motor vehicles were registered in 1948, the number of new vehicles manufactured is only a small percentage of the total of 36,573,000 passenger cars and trucks now licensed to operate on the nation's roads. The total new car and truck registrations since 1946 has been only 11,121,000. This means that less than one-third of all cars on the road are post-war models.

More cars of 1941 vintage are registered than any other year—slightly more than four million. Second greatest number of cars of any one year's make are 1937 models, with 1947 models third.



Here's where a few pennies can save you many dollars. Just a simple application of RuGLYDE Rubber Lubricant may prevent premature tire and tube failure and most certainly speed the mounting and dismounting of bus and truck tires. This 100% SAFE, non-petroleum, rubber lubricant is endorsed and used by car and tire manufacturers and major oil companies for both natural and synthetic tires and tubes.

RuGLYDE prevents pinching and chafing because it provides proper lubrication to seat tubes and flaps with minimum pressure; they slip—not stretch—into place. Will not induce rim rust or cause tire static.

RuGLYDE makes stuck or rusted tires dismount with ease and without damage to bead or rim. This man-and-money-saving rubber lubricant comes in 8 oz. refillable dispenser size and one and five-gallon cans.—AMERICAN GREASE STICK CO., Muskegon, Mich.

OFF AND ON THE RIM WITH RUGLYDE MAKES TIRE CHANGING SAFER, FASTER, EASIER



DISMOUNTING . . . Apply RuGLYDE to both sides of tire along edge of rim. Allow few minutes for penetration, then proceed with removal.



MOUNTING . . . Apply RuGLYDE with a small cloth or RuGLYDE applicator, sparingly, to areas of tires, tubes or flaps requiring a wet lubricant.

ORDER FROM YOUR JOBBER

K-SPUN

The Miracle Metal For Piston Rings

With the development of K-Spun, the miracle metal for Piston Rings, Koppers engineers and metallurgists made possible a tremendous advance in piston ring efficiency.

For years, automotive engineers have known that the top compression ring in any internal combustion engine did 85% of the job. But they knew, also, that the all-important top compression ring rapidly lost most of its effectiveness because no metal had yet been developed with "guts" enough to give long service in today's high-speed, high-compression engines... and no oil ring has ever been designed that can take over the job of the top compression ring.

Piling Up Transportation Records

In Glenn L. Martin planes—in the new Pan American Stratocruiser—in submarines—in giant oil tankers—in cross-country trucks and buses—Koppers K-Spun Piston Rings are setting new records for power and economy.

There are many reasons why so many leaders in the field of transportation insist on Koppers K-Spun Piston Rings in their gasoline and Diesel engines. Find out now why it will pay you to standardize on these revolutionary rings. Koppers Engineering Department will be glad to tell you the whole story. Write today.

Guaranteed

American Hammered Piston Rings made of K-Spun with Porous Chrome Plating are guaranteed against breakage on installation or in service for the life of the engine!

TRANSPORTATION

Hammered

PISTON RINGS



THE FLYING NAVAL BASE

THE MARTIN MARS SETS A NEW WORLD'S RECORD FOR CARRYING VITAL SUPPLIES

THEN YOU AGREE THE MARS CAN CARRY ALL THIS TONNAGE, MR. MARTIN?

CAPTAIN, WE KNOW IT CAN

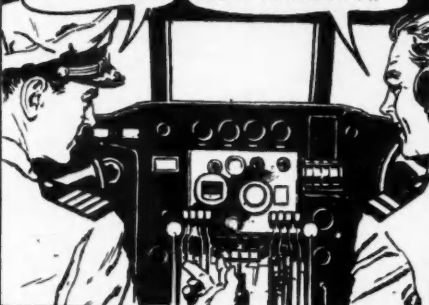


THE STORY STARTS IN THE OFFICE OF GLENN L. MARTIN, WORLD FAMOUS PIONEER IN AVIATION. THE NAVY IS TESTING A NEW IDEA IN TRANSPORT.

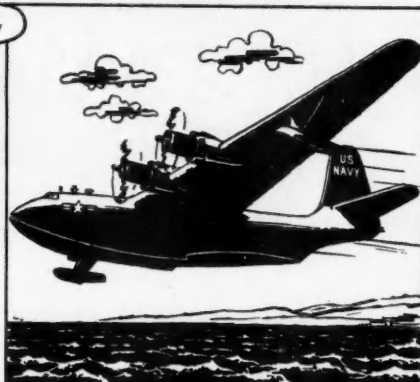


THE DAY OF THE STARTLING EXPERIMENT DAWNS. NAVAL PERSONNEL, WITH MARTIN TECHNICIANS LOOKING ON, LOAD THE SHIP TO THE "GUNWALES." THE AMAZING TOTAL OF 68,283 POUNDS IS REACHED.

THE BIG MOMENT IS HERE! NEXT STOP, LAKE ERIE, 390 MILES AWAY



AS THE CREW CALMLY HANDLES ITS TAKE-OFF TIME DUTIES, THE TOWER GIVES THEM THE GO-SIGN. AND THE MARS BEGINS TO MOVE.



SHE'S OFF THE WATER WITH THE WORLD'S HEAVIEST TONNAGE EVER FLOWN...A VERITABLE "NAVAL BASE WITH WINGS."

JUST IMAGINE...FLYING 34 TONS OF MATERIAL FROM MARYLAND TO CLEVELAND IN LESS THAN 3 HOURS!



LOOK AT THOSE GIANT PRATT AND WHITNEY ENGINES...THEY MUST REALLY HAVE THE STUFF

YES, ENGINE POWER GAVE THE MARS THE TREMENDOUS LIFT TO BREAK THE RECORD...AND THOSE KOPPERS AMERICAN HAMMERED PISTON RINGS PERFORMED AT FULL EFFICIENCY



Tentative Schedule for ATA Spring Meeting

A tentative program for the Annual Spring Meeting of the American Trucking Associations, Inc., to be held May 9 through 13 at Melbourne and Sheraton Hotels, St. Louis, has been announced as follows:

General Luncheons

(For all Groups; Tickets \$3.50)

Tuesday, 12.15 PM, Crystal Room, Sheraton Hotel: "A Banker's Views of the Trucking Industry."

Thursday, 12.15 PM, Caprice Ballroom, Sheraton Hotel: Speaker, H. D. Horton, president, American Trucking Assn.

"LIFE EXPECTANCY"

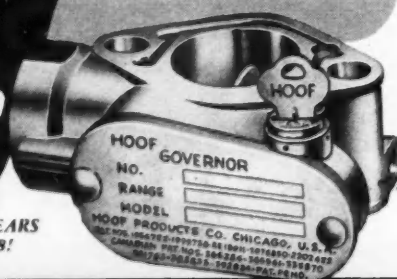
Insurance man talk? Certainly! Consider the life of your vehicles in terms of profit and loss... just as insurance companies figure profit and loss from the "life expectancy" of people!

The condition and length of life of your vehicles determines *your* profit or loss. Today's high prices make it doubly important that you have "insurance" against costly replacements and repair... against high gas, oil, and tire bills.

You don't have to pay high premiums to insure lower operating expense. A Hoof Governor is your "invisible hand" on the throttle of every costly piece of motor equipment... your best insurance against profit-consuming operating costs.

HOOF *key and seal type*
GOVERNORS

NEW! HOOF ALUMINUM-STEEL TIMING GEARS
Matched Sets for GMC, Chevrolet and Ford V-8!



HOOF PRODUCTS CO., 6543 S. Laramie Ave., Chicago 38, Ill.

Council of Safety Supervisors

Monday, 2.00 PM, Colonial Room, Melbourne Hotel:

"How We Use Driver Testing Equipment."

"How We Train and Retrain Drivers."

"How We Use Incentive Plans."

Tuesday, 9.30 AM, Rooms B-C-D, Sheraton Hotel:

Sound Movie: The 1949 National Truck Roadshow Finals.

Business Session of Council of Safety Supervisors.

Report on Revisions in National Truck Safety Contest.

Report on Subject Material of Fleet Supervisors Training Course.

Report on Minimum Standards for Selection and Training of Drivers.

Plans for National Highway Safety Campaign.

2.00 PM, Rooms B-C-D, Sheraton Hotel:

"Effects of Labor Legislation on Safety Activities."

"Job Analysis of Fleet Safety Director's Duties."

"Are Uniform Penalties for Company Rule Violations Desirable?"

Equipment and Maintenance Council

Wednesday, 2.00 PM, Inspection trip to the maintenance shop of a motor carrier in St. Louis.

Thursday, 9.30 AM, Colonial Room, Melbourne Hotel:

Sound Movie: "The Pennsylvania Pilot Study on Sizes and Weights of Commercial Highway Vehicles." Public Roads Administration.

"What Does Anti-Detonant Injection for Engine Offer Commercial Vehicle Operators? Now? In Future?"

"What Can Be Expected in Future Air Brake Stopping Performance on Four, Five and Six Axle Combinations of Vehicles?"

2.00 PM, Colonial Room, Melbourne Hotel:

"How We Use the Chassis Dynamometer As Preventive Maintenance Inspection Instrument."

"Magnaflux Techniques for Shop Use in Examining Used and Repaired Truck Parts."

Friday, 9.30 AM, Colonial Room, Melbourne Hotel:

Sound Movie: "Servicing Techniques for Heavy-Duty Truck Tires."

"The Why's and Wherefore's of the New Advanced Wide Base Rims for Heavy-Duty Commercial Vehicles."

"Fifth Wheel Location and 1,000 Pounds Increase in Payload."

Progress Report on Specifications for Interchange Semitrailers.

2.00 PM, Colonial Room, Melbourne Hotel:

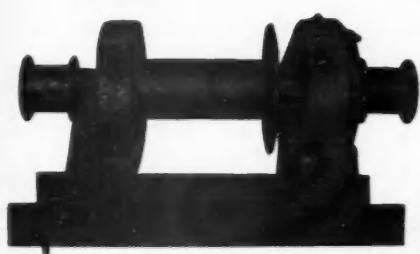
Business session of Equipment and Maintenance Council.

"Manhours Required to Do Various Operations in a Complete Preventive Maintenance Inspection of a Heavy-Duty, Over-the-Road Tractor."

"Voltage Regulation Adjustments and Servicing for Optimum Storage (TURN TO PAGE 276, PLEASE)"

Upsy-Daisy!

**Braden
MODEL
M50-20B**



Safe Working Load, 100,000 lbs.
The NEW BRADEN OIL-COOLED,
FULLY ADJUSTABLE, AUTO-
MATIC SAFETY BRAKE is stand-
ard equipment.
Write for Complete Braden Catalog

Here's a Braden Winch in action. A 68,000 pound load being handled with ease and safety. It's a job all in the day's work for the Braden Model M50-20B. This "big baby" can safely handle loads up to 100,000 pounds, and the operator can always keep the load under perfect control.

BUY BRADEN -- They Are Safer

BRADEN WINCH COMPANY
 1001 East Admiral Boulevard



TULSA 3,
Oklahoma

ATA Spring Meeting

Continued from Page 274

Battery Performance on Over-the-Road Tractors and City-Delivery Trucks."

Committee on Accounting

Monday, 9.30 AM and 2.00 PM, Alexander Room, Melbourne Hotel.

Tuesday, 9.30 AM and 2.00 PM, Alexander Room, Melbourne Hotel:

"ATA Accounting Program for Class II and III Motor Carriers."

"Punch Card Accounting for Motor Carriers."

"Effects of Present Price Structures on Depreciation Accounts for Plant and Equipment."

"Group Purchasing Possibilities in the Motor Carrier Industry."

"The Need for a Better Understanding by Lending Institutions of the Financial Statements of Motor Carriers."

"Possible Procedures for the Further Development of Cost and Performance in the Motor Carrier Industry."

Committee Meetings

Monday:

Committee on ATA Truck Safety Contest, ATA Council of Safety Supervisors, 9.30 AM. Oak Room, Melbourne, Hotel.

Committee on Fleet Supervisors Training Program, ATA Council of Safety Supervisors, 9.30 AM. Baroque Room, Melbourne Hotel.

Committee on Driver Selection and Training Procedure, ATA Council of Safety Supervisors, 9.30 AM Lindell Room, Melbourne Hotel.

Tuesday:

ATA Equipment Advisory Committee, 9.30 AM and 2.00 PM Parlor Room No. 1, Sheraton Hotel.

Wednesday:

ATA Equipment Advisory Committee, 9.30 AM and 2.00 PM. Lindell Room, Melbourne Hotel.

ATA National Committee on Street and Highway Safety, 9.30 AM and 2.00 PM. Alexander Room, Melbourne Hotel.

Sub-Committee on Uniform Forms and Accounting Methods, ATA National Committee on Accounting, 9.30 AM and 2.00 PM. Oak Room, Melbourne Hotel.

Sub-Committee on ICC Accounting and Statistical Requirements, ATA National Committee on Accounting, 9.30 AM and 2.00 PM. Baroque Room, Melbourne Hotel.

Sub-Committee on State Accounting Councils and Chapter Promotion, ATA National Committee on Accounting, 9.30 AM and 2.00 PM. Suite Room, Melbourne Hotel.

First Meeting of Newly Elected Officers of ATA Council of Safety Supervisors, 9.30 AM. (Room to be announced.)

Thursday:

ATA National Committee on Street and Highway Safety, 9.30 AM and 2.00 PM. Alexander Room, Melbourne Hotel.

ATA Industrial Relations Committee, 9.30 AM and 2.00 PM. Lindell Room, Melbourne Hotel.

Friday:

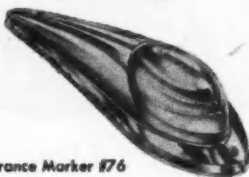
ATA Industrial Relations Committee, 9.30 AM and 2.00 PM. Lindell Room, Melbourne Hotel.

ATA National Roadshow Committee, 9.30 AM and 2.00 PM. Melbourne Hotel,

STOP



Stop Light #307



Clearance Marker #76



Directional Signals #900



Reflex Reflector #139

stop

and think a moment about the number of lamps, clearance markers, mirrors, directional signals, reflectors and utility lights you buy every year.

stop

and think about the number of replacements you have ordered and paid for—needless replacements, required only because these safety devices loosened, corroded, rattled, peeled or simply fell apart! Now...

stop

again and think about the advantages YANKEE offers. First, steel products are "bonded" for super corrosion protection before spraying and baking. Second, items are heavy-duty designed for special, long-lasting truck-trailer-bus service. Third, all YANKEE safety products are checked and tested by outside, independent laboratories—as well as our own. These added products safeguards, we feel, add up to better products, best economy. That's why it will pay you well to standardize with the complete YANKEE line.

YANKEE

TRUCK DIVISION YANKEE METAL PRODUCTS CORP.
NORWALK, CONN.

*talk "Yankee"
with your
jobber today!*

LAMPS • MIRRORS • REFLECTORS • DIRECTIONAL SIGNALS • SPECIALTIES



"Wider, please."

UP NORTH THE NEXT OF ROADS"

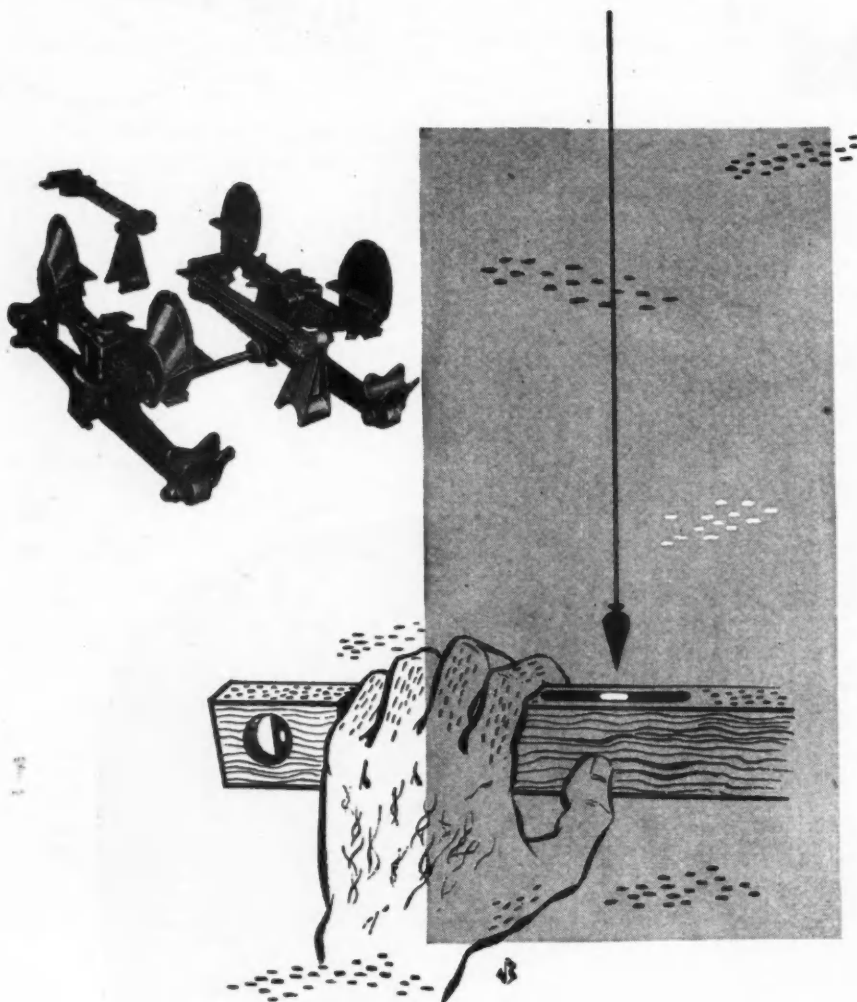


U.S. FLEET SERVICE. Your U. S. Royal Distributor is ready to draw up a tailor-made preventive tire maintenance plan designed especially for your operation—a plan which can give you lower cost per tire mile! He'll give you service where it counts—on your job! Call your U. S. Royal Distributor today. He's listed in your Classified Telephone Directory.

U. S. ROYALS by U. S. RUBBER



"Follow the Leader"



ON THE LEVEL

No pun intended, we're talking about a s-m-o-o-t-h level ride.



The design of the Hendrickson equalizer beam and ball and socket joints provides the flexibility that keeps Hendrickson-equipped rigs on the level. This basic design of the Hendrickson tandem assures its smooth, level performance.

HENDRICKSON MOTOR TRUCK COMPANY
8001 West 47th Street • Lyons (Chicago Suburb) Illinois

NEWSCAST

Continued from Page 234

turned over the management reins to 100 employees who now hold all common voting stock.

Mr. Forward relinquished his common stock for new 3 per cent preferred shares, thus still retaining a financial interest. New common voting stock was sold to 100 of the firm's 425 workers on a voluntary basis. Combined value of the new preferred and common stock in excess of \$500,000. The new owner-workers include representatives from every department, as well as from all of the company's six subsidiary plants.

RUBBER FUEL LINE FOR DIESELS

A new use for rubber hydraulic control hose on large diesel-powered trucks is reported by The B. F. Goodrich Co.

Made to resist the action of diesel fuel, the hose is being successfully used on the fuel injection systems. It replaces copper or flexible metallic tubing ordinarily used for this purpose.

INTRODUCING . . .

. . . W. H. HAMMOND as vice-president in charge of sales for the Marion Metal Products Co. He was formerly with Gar Wood Industries, Inc.

. . . G. H. CRAWFORD as president and general manager of the Valley Motor Lines, Inc. and Valley Express Co., Fresno, Cal., succeeding HAROLD FRASHER, deceased. R. EDWARD BURTON, San Francisco attorney, was elected chairman of both Boards.

. . . FRANK DWYER of Columbus, Ohio, as sales representative in the Ohio, Indiana, West Virginia and Kentucky territory for Yankee Metal Products Corp.

. . . JOHN S. FRENCH as sales manager, West sales section of the Ford division, Ford Motor Co., succeeding S. M. COPLAND who becomes manager of service sales training for the service department.

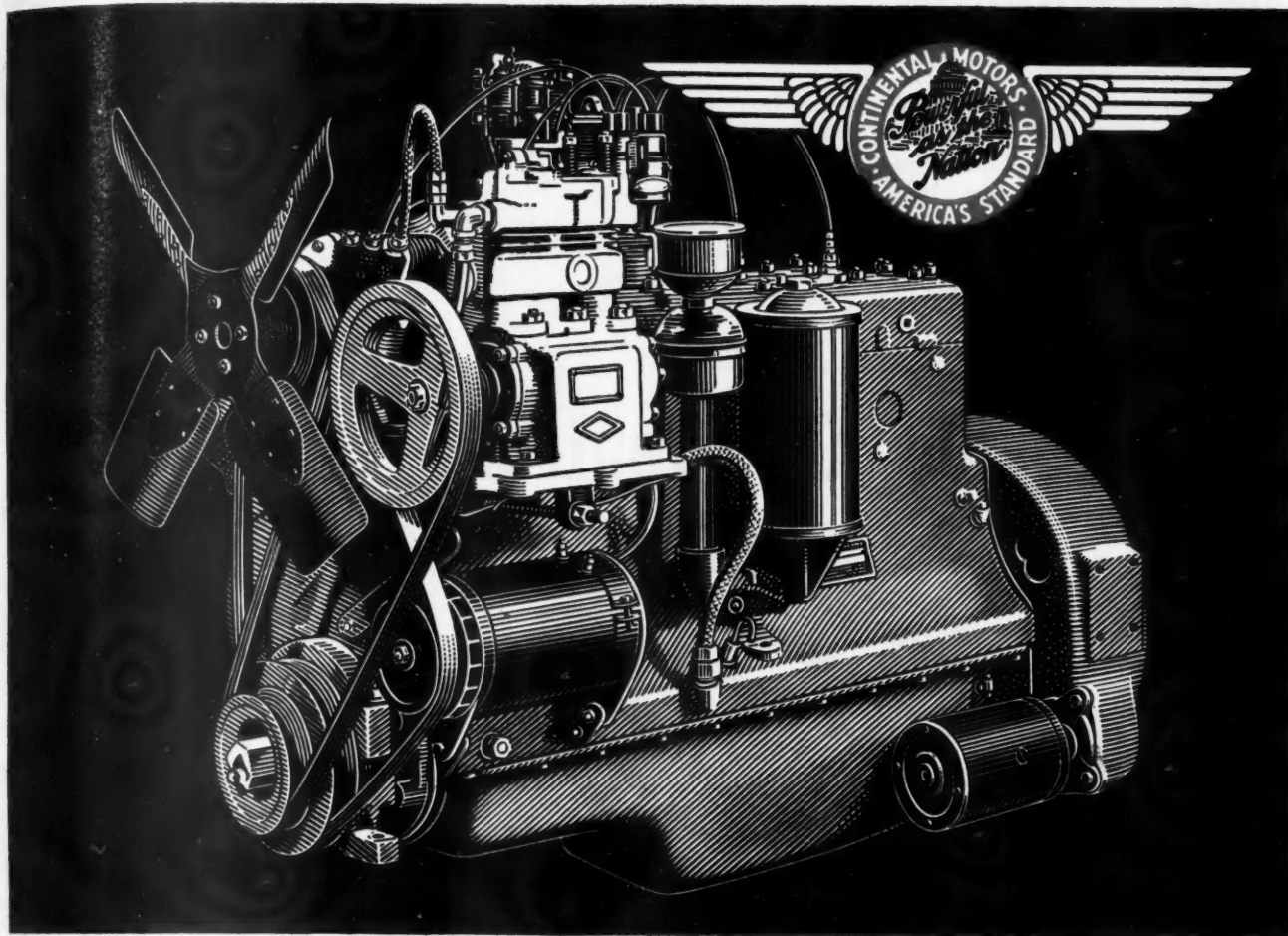
. . . GRADY A. BURT, as manager of the Southeastern Division of the Prest-O-Lite Battery Co., with headquarters in Atlanta. He was formerly district representative in St. Louis.

. . . CHARLES L. HOWES, as Southwest division sales manager for the General Tire & Rubber Co. He will have his headquarters in Dallas, and supervise sales operations in the territories now serviced by branch offices in Dallas, Memphis, Houston, St. Louis and Kansas City.

END

(Please resume your reading on P. 43)

RED SEAL ENGINES



FOR FASTER SCHEDULES LESS TIME OUT LOWEST OVERALL COST

The B-6427 is a 6-cylinder L-head model, delivering 125 horsepower at 2600 r.p.m., and having a generous power reserve above that engine speed. Heat-treated, pressure tested blocks and heads. Statically and dynamically balanced crankshaft. Individual porting for uniform fuel distribution to all cylinders. Sodium-cooled valves and stellite exhaust valve inserts. Full-length water jackets, directed coolant flow, and leakproof water pump.

Here's an engine that's making a great name — for itself and for the vehicles it powers. It's the Red Seal B-6427, which is finding ever-wider application in buses, highway tractors and trucks.

The B-6427 packs the reserve power that means faster pickup, and fewer shifts on the grades. It gets there and back at lowest ton-mile or passenger-mile cost. And it does this with minimum servicing—minimum expensive "time out"—because it's engineered and built for these extra-demanding jobs.

**BUILT
FOR THE JOB!**

Continental Motors Corporation
MUSKEGON, MICHIGAN

State Legislative Developments

▼ A QUICK roundup of pending legislation at state capitals conducted recently by the National Council of Private Motor Truck Owners, Inc., has revealed these salient facts:

Proposed gasoline tax increases ranging from 1/2 to 2 cents per gallon

have been introduced in 21 states. To date none of them have been approved, but should they all be approved, the increase would add about \$170 million to the total annual motor fuel bill of users in the states effected. The following states are

involved: Connecticut, Georgia, Indiana, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, South Dakota, Utah, Vermont, Washington, and Wyoming. Maine is also seeking to make permanent the temporary gasoline tax increase of 2 cents per gallon which is due to expire late this year. In Colorado and Kansas, bills have been introduced that would decrease existing tax rates.

Bills to increase truck fees are now receiving legislative consideration in Idaho, Illinois, Indiana, Kansas, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, Oregon, Pennsylvania, South Dakota, and Washington.

Vehicle sizes and weight limitations are also receiving considerable attention. Indiana has already approved higher standards in this respect (See page 39). Bills to eliminate standard formula and provide gross weight limits based on axle facing have been permitted in Arizona, North Dakota, and Wyoming. Weight increases are being sought in New Hampshire, Indiana, Ohio, Pennsylvania, and Tennessee. Maximum length of vehicle combinations are also due for increase if both bills should be carried in California, Minnesota, Nebraska, North Dakota:

Toll road proposals have been made in Colorado, Massachusetts, Michigan, Nebraska, Ohio, and Rhode Island.

In New York State a bill providing for compulsory vehicle inspection is virtually certain of approval and it includes an important exemption for fleet owners which will permit established shops, who can meet minimum standards, to accomplish and certify their own vehicle inspections.

New York also proposes to make polarized lighting equipment and windshields compulsory on all vehicles beginning in January 1952. Various manufacturing groups are strongly against this proposal (See page 6) and it is considered unlikely that the bill will carry.

Constitutional amendments prohibiting anti-diversion of highway taxes have taken shape in various forms in Arizona, California, Connecticut, New Mexico, New York, and Wyoming. Twenty-one states already have made such constitutional safeguards

Dependable Oil Control



Big-slotted channel-oil ring is held firmly but gently against cylinder walls by well ventilated expander

Two steel segments below the cast iron ring provide that necessary extra scraping action to insure oil control

Every motor mechanic knows the importance of oil control in a rebuilt job. You can GUARANTEE oil control when installing a set of specifically designed Burd "Super Hi-Speed" Piston Rings. They are ENGINEERED FOR RESULTS. Check these three big exclusive Burd features revealed here. This 4-piece piston ring is scientifically designed to handle the tough oil control problems. Burd's "Super Hi-Speed" Oil Ring cuts down overhauling costs by eliminating reboring. Used in the proper combination with Burd Compression and Oil Rings, Burd "Super Hi-Speed" Oil Rings restore sparkling performance and high efficiency in any engine.



BURD PISTON RING CO.
Rockford, Ill.



PISTON RINGS



VALVE PACKING



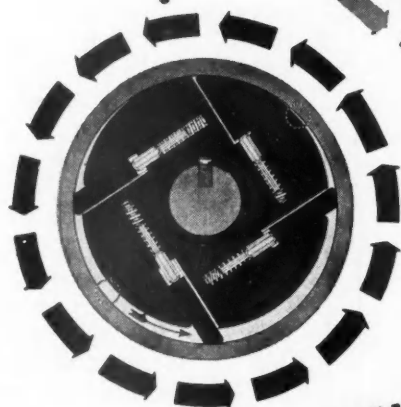
VALVE GUIDES



HoDees
HOT WATER CAR HEATERS

You're right... WHEN YOU INSTALL

Wagner Air Brakes



1 THE ONLY AIR BRAKE WITH THE ROTARY COMPRESSOR

Wagner Air Brake Systems are the only systems that have the Rotary Air Compressor. Check these features: Rotary motion of all moving parts . . . In running balance at all times . . . Longer belt life due to more uniform torque loading . . . Low friction losses—therefore high operating efficiency . . . A predetermined air pressure range automatically maintained . . . Operating parts are lightly stressed insuring long life and low maintenance . . . *Extremely quiet in operation* . . . Self-contained oiling system—uncontaminated by engine waste products . . . Compact—requires minimum installation space . . . Low operating temperature prevents carbon formation in compressor and delivery lines . . . Adaptable to all types of automotive braking systems.

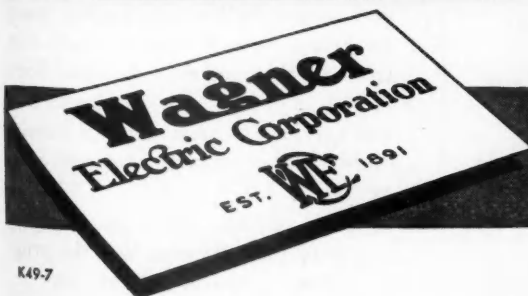


2 NATIONWIDE SERVICE FACILITIES

When you equip your vehicles with Wagner Air Brakes, maintenance is no problem—First, they require less maintenance than ordinary air brakes because of such outstanding engineering achievements as the Wagner Rotary Compressor and the Wagner Power Cluster. Second, when maintenance is necessary it can be handled quickly and economically.

Nationally serviced by Wagner's 25 branches and a network of authorized distributors. Manned by factory-trained air brake repair experts, they can give you quick service and get your vehicles back on the highways in minimum time. Wagner also furnishes factory-rebuilt units and unit repair parts kits for fleet operators who prefer to do their own repair work. They are available from Wagner Distributors or any of the Wagner Service Branches.

Cut Your Brake Maintenance Costs • Increase Your Pay Load Profits • Write For Bulletin KU-50B Today



Wagner Electric Corporation

6470 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.

LOCKHEED HYDRAVAC BRAKE PARTS AND FLUID
CUMMINS BRAKE LINING AND SHOCKS
ELECTRIC BRAKE BOOSTERS AND VALVES



K49-7

Alarm System Builder Warns of Hijack Costs

UNLESS drastic steps are taken early in the year to prevent it, 1949 will probably see another all-time record in truck, cargo thefts and hi-

jackings, with a possibility of at least 7000 vehicles being taken, cargo and all.

This warning was made recently

by Jack Seide, president of Babaco Alarm Systems of New York, speaking before the annual meeting of the Freight Claims Section of the American Trucking Association, in St. Louis.

"During 1948, truck cargo thefts and hijackings reached a new high mark," Mr. Seide said. "Our preliminary estimates indicate that 6500 trucks and trailers were stolen with cargo loss of more than \$35,000,000. This year, truck shipments are running 15 per cent ahead of last year. Even with the same theft rate, losses would be higher. Actually, a higher theft rate is anticipated, as crime is reported on a stepped-up scale nationwide.

"The 1948 theft losses would have been even larger were it not for the truck burglar alarm protection covering \$25,000,000,000 of the most valuable, most sought-after goods moved.

"During the past year, hijackers developed several new markets. Television came into the loss column in a big way for the first time. Whole loads of television sets were taken. Steel, copper, electrical goods, eggs, meat, victrola records, even textbooks were on the year's loss list.

"No. 1 target of the hijackers continued to be textiles and clothing, with several thousand truck loads of these items stolen.

"Every kind of cargo was stolen and in almost every section of the country. New York City naturally led in theft totals, as that city has the greatest concentration of high valued truck movements. But cities from coast to coast were hit. Even small towns far from metropolitan centers were the scene of truck thefts and hijackings, as the crooks followed shipments closely and discovered the most vulnerable points to strike.

"Jump thefts were in increased volume in 1948 and are already reported in even greater volume this year. These are the thefts where loaded, unattended trucks are stolen and where trailers are hauled away by hijackers who operate their own tractors. Some of these involved \$50,000 to \$75,000 loss per load. The average loss in such cases is considerably higher than the over-all average.

"One of the most encouraging events of the past year was the prog-

(TURN TO PAGE 286, PLEASE)

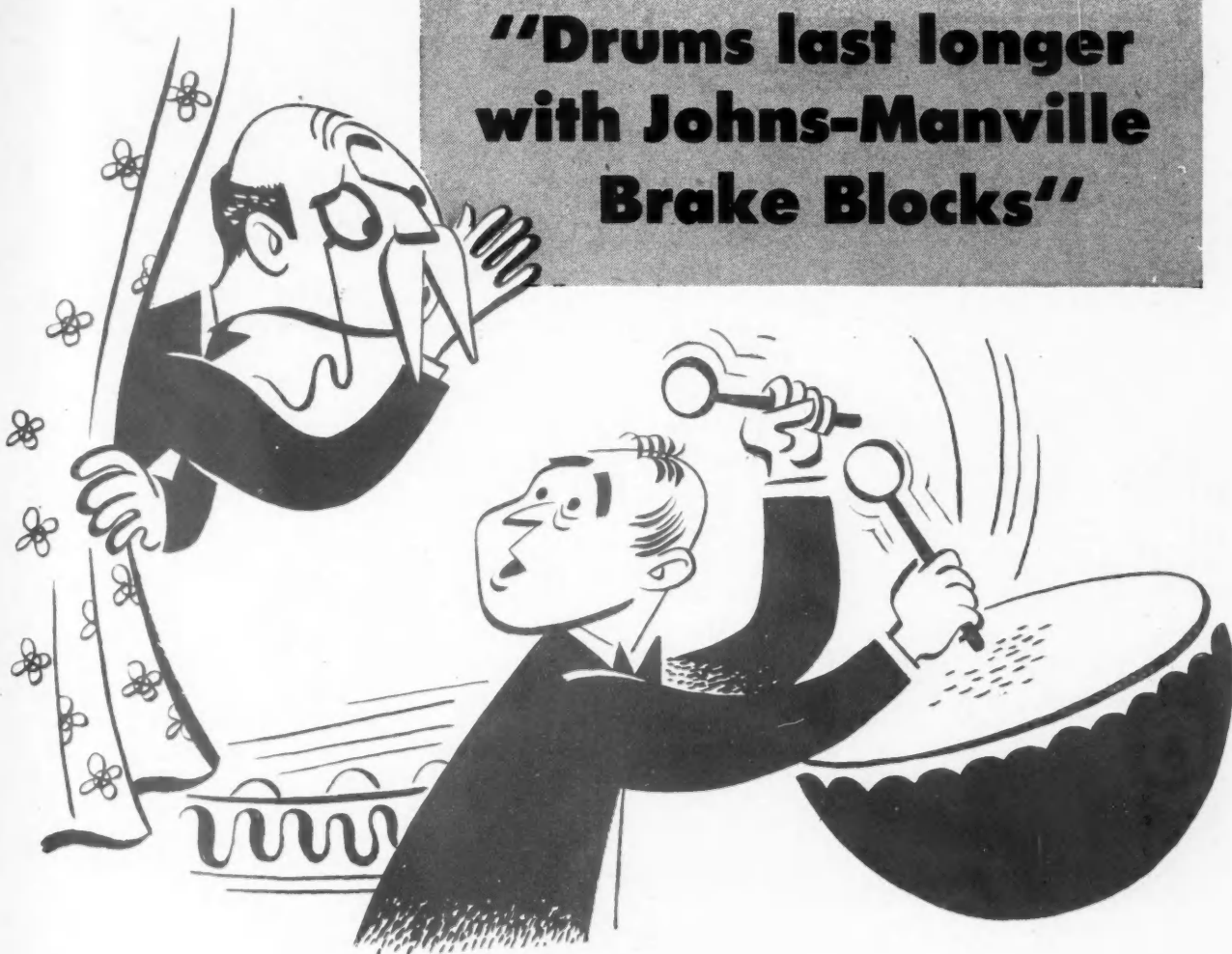
"I have been reading and using **COMMERCIAL CAR JOURNAL** for the past 8 years.

"The information contained in it each month is so valuable that I file the copies and frequently refer to copies several months old, in order to brush-up on some topic or find the address of one of the advertisers, whose product I need and cannot purchase locally."

—The reader who wrote that to us operates a truck line in Indiana. He has 50 trucks and tractors.

This gentleman is a good customer for **COMMERCIAL CAR JOURNAL** advertisers.

**"Drums last longer
with Johns-Manville
Brake Blocks"**



... and you'll get higher temperature resistance, too

ACTUAL laboratory tests have proved that Johns-Manville Asbestos Brake Blocks have higher temperature resistance . . . the result of a new formulation in all J-M Brake Blocks now in full production.

But you get much more than this.

Your brake drums will wear better too . . . because the new J-M Brake Block is the result of a scientifically *balanced* formulation that wears slowly, evenly, without costly scoring or checking of drum surfaces.

All this has been proved on the Heat Check Analyzer,

an exclusive J-M laboratory device for checking both block life and drum life. And these laboratory tests have been carefully checked against actual field results.

You can prove it too . . . by trying the new J-M Brake Blocks on your next brake job. You'll have both blocks and drums giving you bonus mileage . . . bonus mileage that means lower operating costs.

**PRODUCERS OF THE FAMOUS
4-STAR FLEET TESTED SETS**

Johns-Manville



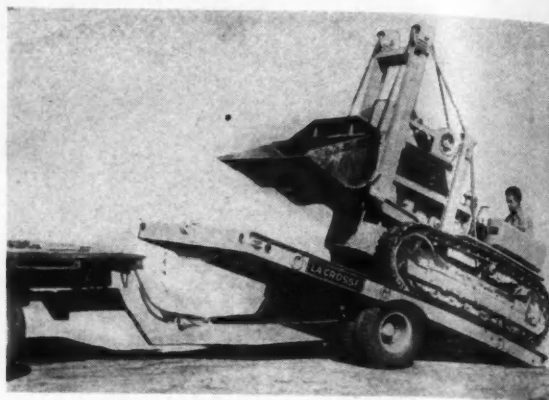
Asbestos

**BRAKE LININGS
BRAKE BLOCKS
CLUTCH FACINGS**

FRICTION MATERIALS

La Crosse Tilting Trailer

One of three new tilting trailers introduced recently by La Crosse Trailer Corp., La Crosse, Wis., this one has capacity of 8 to 10 tons. It can be loaded or unloaded by one man without skids or blocks and can be used with stakes or box sides for hauling bulk materials. Double-acting hydraulic cylinder "cushions" platform when being tilted with or without load. Safety chains, lashing rings and air or vacuum brakes are standard. Removable axle and drawbar permits use of pole trailer

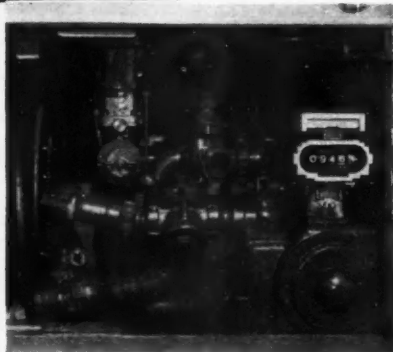


MOBILHEAT TRUCK TANKS Protected by S&J Safety Valves



You would naturally expect any major petroleum marketer to take every precaution in transporting gasoline over city streets and highways, but when you see the same concern handle its less volatile liquids with equal caution, you know that they believe in SAFETY RIGHT DOWN THE LINE. The pictures shown here are a case in point.

Here is a typical fuel oil truck operated by Socony-Vacuum Oil Company. It carries MOBILHEAT fuels for domestic and industrial oil furnaces, and Diesel fuels to stationary engine tanks and to truck filling stations. This truck, just as many of their gasoline trucks, is equipped with S. & J. Internal Hydraulic Safety Valves which preclude spillage of liquid in the event of highway accident, and shut off the flow of fuel automatically should a fire occur during unloading operations. S. & J. Safety Valves afford the maximum in safety, and SOCONY believes that if they help make gasoline transportation SAFE—they want that same SAFETY in hauling their fuel oils.



SHAND & JURIS CO.

BERKELEY, CALIFORNIA

NEW YORK

CHICAGO

HOUSTON

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SEATTLE

SHAND & JURIS

- - - Hijack Costs

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ress in preventive measures taken by truckers, shippers and insurance underwriters, working together. In the final analysis, prevention is the only answer to the situation. The finest police work can only begin after a theft has occurred. It may catch the hijackers, but seldom returns the stolen goods to the shelves. And a new crop of hijackers seem to be harvested every season.

"On the other hand, prevention efforts can stop the truck thief—the hijacker in their tracks. The thousands of trucks under burglar alarm protection, moving \$25,000,000,000 of goods annually, are theft-free today. Other preventive measures include more careful checking of personnel, both on the trucks and within shipping rooms; planned routing of vehicles; better timing of vehicle movements; cautious parking, garaging and holding at terminals.

"Truckers have discovered that insurance protection, even though more necessary and desirable than ever before, is not enough. The insurance claim check, even if it covers the full dollar value of the loss, which it seldom can do, will not give the customer his needed goods. Shipper-customer relations are hurt by such losses.

"There is added pressure today from the underwriters, concerned by the rising loss ratios under their truck cargo and shippers' transportation policies. Not only are losses going up, but they are forcing premiums up and causing many truckers and shippers to find it difficult to secure insurance coverage at all."